



# THE ARMY DOCTRINE AND TRAINING BULLETIN

Canada's Professional Journal on Army Issues  
Volume 5, No. 2 • Summer 2002

LEADERSHIP TRAINING IN BASIC ARMY OFFICER TRAINING  
*Officer Cadet Kristina Reashore*

OUT WITH THE OLD AND IN WITH THE NEW  
*Sergeant Daniel De Groot*

FIX AND STRIKE  
The LAV III in Mobile Defence  
*Second Lieutenant David Hill*

THE CULT OF TECHNOLOGY LAID BARE  
*Major John Malevich, CD*

HISTORICAL AND CONTEMPORARY ISSUES OF HOMELAND DEFENCE  
Countering Terrorism: A Ground-Based Air Defence Perspective  
*Lieutenant-Colonel Christopher Kilford, CD*

WARFIGHTING ESSAY COMPETITION  
"Some Terrible Surprises": Chemical Weapons and Manoeuvre Warfare  
*Second-Lieutenant Mark Gaillard*

WARFIGHTING ESSAY COMPETITION  
Prepare for Battle: Training for 21st Century War  
*Sergeant Arthur Majoor, CD*

LIGHT INFANTRY BATTALIONS: FLEDGING SWANS OF A JOINT-FORCE  
*Lieutenant-Colonel Pat Stogran, CD*

Published Quarterly



National  
Défence

Défense  
nationale

# THE ARMY DOCTRINE AND TRAINING BULLETIN

## Canada's Professional Journal on Army Issues

**T**his is an official publication of Land Force Command and is published quarterly. *The Army Doctrine and Training Bulletin* is dedicated to the dissemination and discussion of doctrinal and training concepts, ideas and opinions by all army personnel and those civilians with an interest in doctrinal, training and other military matters. Articles on related subjects such as leadership, ethics, technology and military history are also invited. Considered, reasoned debate is central to the intellectual health of the army and the production of valid doctrine and training policies. Articles promoting thought and discussion are therefore welcome. All ranks and personnel from other environments are encouraged to contribute. Opinions expressed in the articles remain those of the author and do not represent departmental or Canadian Forces policy. The doctrine, training and other updates do not represent authority for action on that particular topic. All published material remains the copyright of the Department of National Defence and may be used with written permission from the Managing Editor.

### ARTICLE GUIDELINES

Articles of any length will be considered for publication, the ideal length being 3000 to 6000 words. Articles can be submitted in either official language. Usage and spelling are in accordance with *The Canadian Style: A Guide to Writing and Editing* (Minister of Supply and Service 1997) and *Le guide du rédacteur de l'administration fédérale* – both are available via [www.pwgsc.gc.ca/termium](http://www.pwgsc.gc.ca/termium), libraries or bookstores; and *The Concise Oxford Dictionary* or *Le Petit Robert*. Supporting tables, charts and images must be provided by the author and should not be embedded in the text. Articles must include endnotes. Contributors must include a brief biography citing their academic background, noteworthy military or other experience, key courses and current position. Articles can be submitted via e-mail or regular mail (a disc copy must be included). All submissions will be reviewed by an Editorial Board and contributors will be notified by the Managing Editor on the status of their submission. The Managing Editor reserves the right to make minor editorial changes to grammar or style. Authors will be contacted should their submission require revision.

### STAND-UP TABLE (COMMENTARY) GUIDELINES

Contributions to the Stand-Up Table should be no longer than 1000 words and can be made anytime. Every effort will be made to publish these in the earliest issue possible. Comments on articles should be submitted as soon as possible following the publication of that article.

### DEADLINES

Please contact the Managing Editor to confirm submission deadlines:

Spring Issue:	By 15 September
Summer Issue:	By 15 December
Fall Issue:	By 31 March
Winter Issue:	By 30 June

### DISTRIBUTION AND ELECTRONIC COPIES

The *Bulletin* is distributed throughout the Army and to select NDHQ, Maritime Command, Air Command and DISO addresses. Copies are also provided to defence-related organizations, allied armies and members of the public and academia. Inquiries regarding distribution are to be made to the Managing Editor. An electronic version of the Bulletin is available at [www.army.dnd.ca/ael/](http://www.army.dnd.ca/ael/).

### CORRESPONDENCE

All contributions and correspondence should be sent to the Managing Editor, Major John R. Grodzinski, as follows:

The Managing Editor  
Army Doctrine and Training Bulletin  
Land Force Doctrine and Training System  
PO Box, 17000 Stn Forces  
Kingston ON K7K 7B4

Telephone: (613) 541-5010, extension 4874  
Fax: (631) 541-4478  
Internet e-mail: [mail854g@dnd.ca](mailto:mail854g@dnd.ca)

### EDITING AND LAYOUT

The final editing of each issue is performed by the Army Publishing Office, Land Force Doctrine and Training System, Kingston, Ontario:

*English Editors:* Lieutenant(N) Brian Lawrie-Munro,  
Ms. Sandra Hanisch, Ms. Karen Johnstone,  
Mr. Greg Taylor

*French and English Editors:* Mr. Gilles Langlois,  
Mr. Geoffrey Meyer

*French Editors:* Ms. Thérèse Lessard, Ms. Melissa Martin

Layout and proofreading services are provided by:



CF Training Materiel Production Centre  
(204) 833-2500, ext. 5356

---

# Table of Contents

---

<b>GUEST EDITORIAL</b> .....	<b>1</b>
<i>Colonel Steve Appleton, MSM, CD</i>	
<b>FROM THE DIRECTORATE OF ARMY DOCTRINE</b>	
<b>CID BOREALIS 2002, 2-22 JUNE 2002 – AN UPDATE</b> .....	<b>3</b>
<b>ARMY TERMINOLOGY BOARD</b> .....	<b>8</b>
<b>FROM THE DIRECTORATE OF ARMY TRAINING</b>	
<b>PREPARING FOR WAR: REVAMPING COLLECTIVE TRAINING IN THE CANADIAN ARMY</b> . . .	<b>10</b>
<b>FROM THE DIRECTORATE OF LAND FORCE READINESS</b>	
<b>ARMY TRAINING AND OPERATIONS FRAMEWORK –</b>	
<b>UNDERSTANDING MANAGED READINESS OR ATOF FOR DUMMIES</b> .....	<b>12</b>
<i>Major André Corbould, CD</i>	
<b>LEADERSHIP TRAINING IN BASIC ARMY OFFICER TRAINING</b> .....	<b>19</b>
<i>Officer Cadet Kristina Reashore</i>	
<b>OUT WITH THE OLD AND IN WITH THE NEW</b> .....	<b>24</b>
<i>Sergeant Daniel De Groot</i>	
<b>FIX AND STRIKE</b>	
<b>THE LAV III IN MOBILE DEFENCE</b> .....	<b>26</b>
<i>Second Lieutenant David Hill</i>	
<b>THE CULT OF TECHNOLOGY LAID BARE</b> .....	<b>31</b>
<i>Major John Malevich, CD</i>	
<b>HISTORICAL AND CONTEMPORARY ISSUES OF HOMELAND DEFENCE</b>	
<b>COUNTERING TERRORISM: A GROUND-BASED AIR DEFENCE PERSPECTIVE</b> .....	<b>48</b>
<i>Lieutenant-Colonel Christopher Kilford, CD</i>	
<b>WARFIGHTING ESSAY COMPETITION</b>	
<b>“SOME TERRIBLE SURPRISES”: CHEMICAL WEAPONS AND MANOEUVRE WARFARE</b> . . .	<b>57</b>
<i>Second-Lieutenant Mark Gaillard</i>	
<b>PREPARE FOR BATTLE: TRAINING FOR 21ST CENTURY WAR</b> .....	<b>63</b>
<i>Sergeant Arthur Major, CD</i>	
<b>LIGHT INFANTRY BATTALIONS: FLEDGING SWANS OF A JOINT-FORCE</b> .....	<b>66</b>
<i>Lieutenant-Colonel Pat Stogran, CD</i>	
<b>BOOK REVIEWS</b> .....	<b>71</b>
<b>THE STAND-UP TABLE</b> .....	<b>81</b>

# Part of Our Heritage



In October 1941, a Canadian brigade known as "C" Force sailed from Canada to help defend Hong Kong. On 8 December 1941, the Japanese attacked Hong Kong and on Christmas Day, the island surrendered. The image depicts an infantryman in tropical dress. (Courtesy Directorate of History and Heritage).



A member of the Royal 22<sup>e</sup> Régiment in Italy, 1943. Among the units that landed on the Italian mainland on 3 September 1943, were members of the Royal 22<sup>e</sup> Régiment. The Van Doos landed on "Fox Green" beach at approximately 0700 hrs and met no resistance in securing their two objectives. (Courtesy Directorate of History and Heritage).



An infantryman from Le Régiment de Hull, Kiska, 1943. The 13th Canadian Infantry Brigade Group accompanied the American forces that sought to recapture the island in August 1943, only to find the Japanese had left. Canadian personnel wore US cold weather clothing and web gear with their battle dress. (Courtesy Directorate of History and Heritage).

# Guest Editorial

by Colonel Steve Appleton, MSM, CD  
Director, Directorate of Land Force Readiness

I would first like to extend my thanks for being offered the kind invitation to write this guest editorial. Serving as the Army's G3 for the past three years has been an incredibly enlightening experience and provided me with a certain perspective that I wish to share with the readership. I have chosen a theme that is as simple as it is complex: readiness.

The readiness equation, in my opinion, has remained elusive to us as a professional army. As one part of the force employment process, I take great

## ***The readiness equation ... has remained elusive to us...***

pride in the many successes we have had and will continue to have in operational theatres. This reality speaks volumes for our soldiers, leadership, and training. What concerns me, however, and serves as the focus of my commentary, has been everything leading up to the actual employment phase. This spectrum of activities is the domain of *readiness*. As often as we have performed these activities, the concrete notion of readiness remains blurred. The fact that several military definitions for readiness exist, none of which is the same, dilutes a common conceptual understanding. Moreover, years of extreme resource constraints have diminished our ability to actually solve tangible readiness problems whether they be related to stocking levels or the number and type of units required in the force. As essential as it is for the Army, modernization will continue to create turbulence at the unit and operational level, thus affecting readiness. And lastly, operational fatigue, particularly that associated with Bosnia, has drained a certain level of energy and disruptive thinking from the collective leadership, of which I am part, which is requisite for an honest

reconciliation of the readiness issue. Cumulatively, these factors (and there are others) have proven to be quite formidable to overcome when seeking a substantive avenue of addressing readiness.

But the reality is that the readiness question has been addressed. In many ways I was merely looking in the wrong places. Nowhere, in my opinion, has the military readiness issue been better explored in the past few years than in a paper by Major Mike Voith, at the time of this writing, Commanding Officer of 4 Engineer Support Regiment. Published in this journal in 2001,<sup>1</sup> it should be required reading. Two messages from the paper are of par-

ticular interest: the categorization of readiness into an operational, structural, and mobilization dimension, and the necessity of inserting a time component into the readiness equation. Several months later, I had the opportunity to discuss readiness issues surrounding the task of the Immediate Reaction Force (Land) (IRF[L]) with Lieutenant-Colonel Pat Stogran, who is now leading his battalion group in Afghanistan. He brought to my attention the need for *combat readiness*. I found this proposal to be equally compelling and reinforcing of Mike Voith's analysis.

Before continuing, it is key that we appreciate one additional component of any readiness equation: the notion

of *purpose*. Specifically, the fundamental questions of ready for what? and ready for when? must be addressed. The former has been well articulated in the Army's *Future Security Environment*, which provides a forward-looking operating environment. Additionally, past and ongoing operations (e.g., Operation APOLLO) and domestic security events have brought a degree of reality to the asymmetric threat mantra that until now has been mostly conceptual. The latter question on readiness is specified in the CF's Defence Plan and reiterated in the Army Strategic Operations and Resource Direction (SORD). Notice-to-move timings are clearly defined, as is the sustainment aspect of a potential deployment. Therefore, in terms of *purpose*, the Army is well situated.



Who is championing operational-level readiness?  
(Courtesy Combat Camera)

Using the readiness categorization proposal of *operational* and *structural* (I choose to not address *mobilization* at this time), I believe it is here where we as an Army can do better. Strategically, the Army Commander has identified readiness (specifically, *manage readiness*) as one of his four objectives and created a campaign plan that features managed readiness as one of the five operating lines. The overall context has, therefore been set.

Advancing this issue by using the category of *operational readiness* means assessing the time component of a unit's inherent potential for combat, within the threat setting provided, and its actual capability. This time-delta is critical. Based on the aforementioned CF and Army plans, it also determines achievability. If an Army unit is deemed to be in high readiness—capable of deploying to an operational area in 30 days or less—it implies the unit is combat ready prior to departure. As we all know, this degree of readiness demands extraordinary scrutiny and support. It starts at the individual level and cascades out to the entire combined arms team. In the past, this team has been treated in a generic sense based on doctrinal precepts. Aligned to the security reality of the twenty-first century and recent combat operations, units in high readiness must be more effectively grouped, and should realize their potential for conducting combat operations *before* entering the high readiness category. Once validated to assume the high readiness mantle, such units should strive to maintain this combat potential within the 30-day criterion. Without doubt, this state of readiness is resource intensive and presents a resource-constrained Army with incredible challenges. Therefore, two plausible options emerge: we must more rigorously identify the type of combined arms team to place in high readiness, thereby task-tailoring on an unprecedented level, or we re-define the criteria for high readiness.

The second category of structural readiness is quite topical. Army structures and transformation have been hotly debated for years. New structural models are again under review as the Army faces the affordability crisis. As the Army Commander has stated several times, the Army has too much structure for its budget. Less is needed. These decisions will be extremely difficult and, unfortunately, are an anathema to all of us, but ignoring the issue is not acceptable. Using readiness as a benchmark, though, objective clarity is possible. In simple terms, structural readiness speaks to identifying and then bringing into operational readiness the proper number and type of units before a crisis surfaces. Again, by aligning to the present and future

***... we must more rigorously  
identify the type of combined arms  
team to place in high readiness...***

security environment, assessing coalition realities, and understanding individual and collective training imperatives, we can reasonably identify the units needed to comprise the all-arms team at tiered levels of readiness. Those units or groupings of high usage and long training protocols require higher levels of readiness. The fact that modernization and equipment complexity is an added aspect of the training protocol is abundantly clear. To a certain degree, this delineation of structural readiness can be made along full- and part-time lines, consistent with the Land Force Reserve Restructuration (LFRR) theme of complementary and supplementary forces. In some cases, this tiered approach can be represented by unit manning levels and Army recruiting targets. What is sufficiently clear is that neither operational readiness nor combat readiness will ever be optimized if the structural dimension is not correct.

After three years of managing readiness issues, I believe we are moving in the proper direction. A managed readiness framework is the proper architecture upon which to better understand and eventually resolve the aforementioned challenges. The framework has already provided us with the specificity we need at the strategic level to make decisions and adjustments in accordance with changing national circumstances. As the readiness picture matures further, brigade training events, the Canadian Manoeuvre Training Centre (CMTCC), and simulation technology have the potential to permit us to fully realize operational readiness levels. We all know that the *will* to be as combat ready as possible exists at the unit level; it is a matter of being provided the means. I am confident this will be delivered. Alternatively, I do have some concern on where we are headed in a structural readiness sense, as the affordability issue has reached such extreme proportions. To optimize readiness, it will be necessary to correct existing structural weaknesses as we move forward on Army transformation and interim models. A strategy that champions readiness must embrace not only the operational but also the structural component.

In conclusion, the opportunity to serve as G3 has been a true privilege. Hopefully, some of the ideas presented herein and previously submitted by others will prove helpful to the Army leadership as we confront this enormous task together. In the final analysis, we all want the same end-state: a combat-ready force.



## ENDNOTES

1. Major Mike Voith, "Military Readiness", The Army Doctrine and Training Bulletin, Vol. 4, No. 2, Summer 2001, pp. 41 - 48.

# From the Directorate of Army Doctrine

## CID Borealis 2002, 2 - 22 June 2002 — An Update

### BACKGROUND

The focus of national military strategy has shifted from an emphasis on a single global threat to a fast-paced, rapidly changing environment driven by crisis situations. Responses to these situations have increasingly taken on a multi-national character and are often bringing together national warfighting capabilities that have not worked together extensively in the past. The interoperability of communications and information systems (CIS) within and between multi-national formations such as those formed by America, Britain, Canada and Australia (New Zealand) or the ABCA (NZ) coalition nations has, therefore, become increasingly important and complex.

The ABCA (NZ) Program began in 1947 when General Eisenhower and Field Marshal Montgomery agreed that the levels of co-operation and standardization achieved during the Second World War should be maintained and extended. America, Britain and Canada were the original members, and Australia joined them in 1963. New Zealand became an associate member through Australia in 1965. The ABCA (NZ) strategy is to ensure that member armies achieve the agreed levels of standardization necessary for two or more ABCA armies to operate effectively within a coalition.

To facilitate achievement of this strategy, ABCA (NZ) nations participate in a variety of workshops, conferences, exercises and demonstrations. Combined Interoperability Demonstration (CID) Borealis 2002 is one such demonstration that will focus on CIS interoperability. While previous CIS activities have occurred, CID Borealis 2002 will be the first activity to deploy troops and material with a view to assess interoperability as a characteristic of ABCA (NZ) tactical CIS. It is intended

to conduct tactical interoperability activities on a regular basis. CID Borealis 2002 will take place from 2 to 22 June 2002 at CFB Kingston.

### AIM AND SCOPE

The aim of CID Borealis 2002 is to test CIS interoperability among the participants in order to prepare and enable those nations to operate together in support of coalition tactical operations.

The scope of interest for testing includes achieving, confirming and documenting tactical interoperability as a quality of current national CIS. This includes the network domain level, end-to-end user capabilities of land-based CIS systems, and the user domain associated with command and control (C<sup>2</sup>) and electronic warfare (EW) applications. The demonstration will enrich participating nations with the necessary knowledge to efficiently transfer data- and voice-based information between various tactical CIS equipment and personnel using their own equipment. The table at the end of this update provides additional insight into the scope of testing.

### OBJECTIVES

CID Borealis 2002 includes the following overall objectives:

**Planning.** Planning will provide a forum to exchange CIS information and to maintain verified data of the technical characteristics of each participating country's CIS equipment. It will familiarize participants from the ABCA (NZ) armies with each other, with their command and control structures, and with their individual national perspectives.

- The primary objective of planning is to identify planning, operational, technical and support procedures to achieve CIS interoperability.

- The main result of planning is a coalition tactical network consisting of switches, routers, cable, and radio subsystems that will be subjected to a testing regime.

- The planning process produces four main deliverables: the architecture for the coalition tactical network and its sub-networks, the test plan, the analysis plan, and the support plan.

**Coalition Tactical Network.** The establishment of the coalition tactical network will be through a series of stages starting first with technology-centric workshops focusing on sub-networks. The sub-networks will then be combined and integrated to form the coalition tactical network configuration of switches and routers that will have been deemed feasible by prior planning. The primary objectives of establishing such a tactical network will be:

- To establish and test a voice and data network that will confirm distinct communications and information systems interoperability.
- To establish the capability of data and voice networks via various means (including a variety of transmission systems and network configurations).

**Testing.** Testing objectives will be achieved through a testing and documentation process in a collaborative, sequential and deliberate test-bed environment. Testing priorities will be established by each participating nation and co-ordinated by the host nation based upon current equipment, national interest, and high probability of implemented connectivity. The test planning will allow nations to conduct bilateral interoperability testing prior to the coalition tactical network being constructed. The testing will identify interoperability gaps and either develop



workable solutions to achieve interoperability or enable nations to identify areas for consideration within future procurement or post design enhancement. The immediate testing objectives are:

- To confirm communications connectivity and CIS interoperability.
- To test the capability of data and voice networks via various means.
- To test the stability of communications connectivity.

**Analysis and Recording.** Analysis and recording will establish the quality of data and voice networks in areas such as interoperability, stability and flexibility. It will lead to the creation of a CIS interoperability guide designed for use by the operational planner, the national equipment acquisition staff, as well as the equipment operator in the field. The immediate objectives of analysis and recording include:

- Documentation of the level of interoperability achieved to date.
- Production of a list of “achieved” and “non achieved” interoperability areas to serve as the basis for future CIS interoperability planning to support subsequent ABCA (NZ) demonstrations and CIS interoperability tests.
- Documentation of areas of required future work.
- Preparation of a list of Quadripartite Standardization Agreements (QSTAGS) to be validated.
- Emphasis on the importance of human interoperability in any operation and to establish human relations and personal contacts among the CIS professionals of the participating nations.

#### ORGANIZATION

**C** ID Borealis 2002 is an ABCA (NZ) directed demonstration consisting of a series of CIS-related interoperability planning conferences and a deployed demonstration conducted among participating nations.

Governance for the demonstration is provided by ABCA national heads of delegation (HODs) and the national points of contact (NPOCs) associated with the Quadripartite Working Group – Communication Information Systems (QWG - CIS). The HODs are responsible for the concept paper, the technical goals, and objectives, as well as ensuring the planning process and the execution of the exercise progress smoothly under the leadership of the demonstration director. The HODs are also responsible for appointing the chairpersons for each workshop.

CID Borealis 2002 is based on three organizational pillars:

- **Interoperability Engineering Teams (IETs).** The IETs are responsible to plan, develop and field the sub-networks and coalition tactical network upon which testing will be conducted. Each nation has designated a national IET chief who responds to the guidance of the demonstration Chief IET. To manage the work and provide for broad participation by all nations, the division of labour for the IETs has been divided into workshops that provide a focus for the technical planning and execution of tests. National IET chiefs are also workshop chairpersons. The IETs convert to workshops when activities move from planning to deployment.
- **CID Borealis 2002 Project Office.** The CID Borealis 2002 Project Office will co-ordinate host nation support through the planning phases and then establish a demonstration headquarters (HQ) to provide the infrastructure and logistics support during the demonstration. The demonstration HQ will be responsible for co-ordinating site set-up, administrative communications, billeting, welfare and messing during the demonstration, as well as all deployment/redeployment transportation requirements. The HQ will co-ordinate a variety of other activities designed to enable and encourage human interoperability.

- **Joint Interoperability Test Command (JITC).** JITC, a sub-component of the United States Defense Information Systems Agency (DISA), brings to CB2K2 the necessary expertise for reliable CIS interoperability testing and documentation support. JITC supports the planning and testing activities; the actual conduct remains the responsibility of participating nations. JITC will supervise test teams who, in accordance with the test schedule, evaluate equipment interoperability.

#### PARTICIPANTS

**P**articipation in CID Borealis 2002 is restricted to ABCA (NZ) nations and those countries and organizations invited to observe or participate:

- Full participating nations serve as equal partners in determining the concept, the technical goals, objectives and direction of the demonstration. They participate with CIS material and are limited to the ABCA (NZ) nations.
- Observer nations and organizations are invited to observe demonstration events but do not bring their own equipment to participate in workshop activities. For example, representatives from other interoperability forums and ABCA (NZ) working groups who are invited to attend the demonstration would be considered as observers.
- Visitors are the responsibility of the host nation support (HNS) section. For visitors not within ABCA (NZ), every visit must be accepted first by the host nation, secondly by ABCA, and then by all participating nations.

#### CONDUCT

**T**he conduct of CID Borealis 2002 is divided into five phases:

**Phase 1 – Design.** This phase established the general concept for the demonstration. High-level guidance deliverables include the exercise



directive, demonstration objectives (technical and otherwise), testing priorities and an outline-planning organization. Design reviews were conducted between nations to provide baseline information on system interoperability and equipment configuration. From this, courses of action were developed and resourced for the remaining phases. Nations also submitted their first estimate of the number of personnel and types of equipment that will be deployed. This phase is now completed.

**Phase 2 – Development.** During this crucial phase, the technical priorities approved by the HODs are implemented in the form of a draft network architecture and draft test plan. The technical characteristics of the equipment are collected. This data is used to plan the testing to be conducted during the employment phase and for inclusion in interoperability documents. In short, the two primary activities of this phase are:

- The CID Borealis 2002 Project Office develops a draft support plan.
- Risk mitigation in the form of testing specific equipment is conducted as deemed necessary to decrease risk during the employment phase.

**Phase 3 – Pre-Deployment.** This phase provides an opportunity to review the quality of the plans. This is done through activities identified during the courses of action discussions held during the design phase. Currently, two pre-deployment activities are planned:

- A visit to Exercise COMBINED ENDEAVOR 2002 (CE02) in May 2002.
- A review of CID Borealis 2002 plans with national signal unit leadership immediately prior to start-ex.

**Phase 4 – Employment.** The employment phase will be conducted in four stages:

- Stage One will see the national contingents arrive in Kingston, deploy, set-up, power up and

internally prove their national CIS systems. During this time, workshop chairpersons will be organizing the conduct of their workshops. Training will be conducted for network managers and test team evaluators.

- Stage Two will focus on achieving interoperability within technology specific workshops on a bilateral and multilateral basis in accordance with the test plan. Workshops will run activities wherein similar technologies are interconnected and the point-to-point, bilateral aspects of the test plan are conducted. Through these activities, sub-networks of the coalition tactical network will be proven. When a basic level of interoperability and stability within the workshops have been established, the workshops will assist the network management organization with the construction of the coalition tactical network that had been planned during the prior planning conferences. Network management processes will be refined during Stage Two.
- Stage Three will focus on building the coalition tactical network that had been designed during the planning process. This will entail the progressive layering of individual sub-networks to form a coalition tactical network consisting of switch, router, radio, and application technologies that provide voice, data, transmission and information exchange services. Once the coalition tactical network has been established, its quality in terms of interoperability will be assessed under the direction of the

Technology Centric	Process Centric
VHF – NZ HF – CA LAN/WAN – AS Switch – CA IS – US	Network Management – CA Testing Plan – Joint Interoperability Test Command (JITC) EW/SigInt Support – CA

Network Management Workshop and in accordance with the latter stages of the test plan. Throughout Stages Two and Three, test team evaluators will be meeting with workshop members and national

representatives to conduct tests, record results, and where possible, assist with problem solving.

- Stage Four includes closing ceremonies, take down of equipment and departure of national delegations.

**Phase 5 – Analysis.** Interoperability is but one characteristic of several that will be considered when analysing the quality of a network. Other characteristics include flexibility, responsiveness, availability, redundancy, reliability, stability, mobility, discipline and sustainment. The technical interoperability test results to be gathered by JITC will be analysed to provide quantitative insight into the interoperability characteristics of ABCA (NZ) CIS. During this process it will be possible for JITC and demonstration staff to make a qualitative assessment of CIS availability, reliability, redundancy and stability. Characteristics such as responsiveness, redundancy, mobility, discipline and sustainment will be research objectives for the operational analysis to be conducted by the Quadripartite Working Group – Operational Research / Special Working Party – Exercise Planning and Analysis (QWG OR/SWP EPA).

## WORKSHOPS

During the planning of CID Borealis 2002, workshops (WS) have been established to facilitate technical planning and the execution of testing. These WS are technology-centric or process-centric depending on the recommendations of the CID Coord / Chief IET and the decisions of the HODs. The current workshops are:

Within the demonstration, the workshops form the “technical” chain of command. The workshops are composed of subject matter experts from the participating nations. They are responsible for developing the

technical network architecture and test plan. A chairperson, who could be a national IET chief or national representative to the QWG/CIS Special Working Party/CIS Interoperability Engineering (SWP/CIE) will lead each WS. Workshops will be asked to designate a deputy chairperson. Each workshop chairman is a member of the Network Management Workshop as are representatives from JITC and national delegations.

The Network Management Workshop is responsible for participating in the planning and co-ordination with the different workshops to achieving national, workshop and test objectives. During the deployment phase they are in charge of co-ordinating and facilitating the building of the tactical networks and the execution of the test plan with the national delegations, JITC and workshop chairpersons.

During the Design Phase, QWG/CIS has canvassed other QWGs to assess their interest in participating in CID Borealis 2002. Quadripartite Working Group – EW/ SigInt Support (EW/SS) expressed interest in participating primarily as a parallel process-centric workshop to test EW sensor interoperability in connectivity, data collection and data display. In addition, QWG Engineers has expressed interest for their Field Support Special Working Party (Topo Fd Sp SWP) to participate to test data transfer capabilities.

## PRODUCTS

**T**horough documentation of the interoperability testing conducted during demonstration is essential. The data provides CIS planners with

important information needed to plan future CIS architectures. The documentation of the tests provides the baseline for future testing. The following list is representative of the products that will be produced during an annual demonstration:

### **ABCA CIS Interoperability Guide.**

This guide, produced under agreement with JITC, provides detailed information on the results of the interoperability testing and data exchange conducted during the workshops. The data will be a resource to use in the development of CIS architectures during workshops and real-world operations. The CIS Interoperability Guide is produced by JITC in a web compatible version on CD-ROM. A hard copy of the CIS Interoperability Guide will be provided to delegations.

### **Operational Analysis Report.**

This report, produced by SWP Exercise Planning and Analysis (EPA) assisted by JITC, provides a senior-level overview of the demonstration. It includes the results of the exercise and their operational impact on coalition operations.

**Employment Plan.** This plan, produced during the planning conferences by the workshops under the supervision of the Chief IET and published by JITC, provides detailed information on the conduct of the Employment Phase and associated testing. It outlines the workshop organizational structure and testing schedule.

**Support Plan.** This plan provides detailed support information and logistics requirements associated with the demonstration. It is produced and published by the host nation under the supervision of the Chief of Host Nation Support (Ch HNS).

**After Action Report.** The AAR reviews the year's activities and has embedded lessons learned. It is produced by the ABCA (NZ) office in Washington.

### **CID Borealis 2002 Web Site.**

(<http://www.cidborealis.ca>) This public/private-accessible web page provides non-sensitive information about CID Borealis 2002 as well as historical data and information about upcoming events. Canada currently hosts the site. It will become an information management tool during the Deployment Phase of CB2K2.

## FUTURE DIRECTIONS

**A**BCA will focus on achieving and sustaining CIS interoperability among the participants by continuing to sponsor conferences, workshops, and demonstrations. The primary focus of CIS interoperability testing will be network oriented, including any communications subsystems that interface or interconnect with the network. Testing may be expanded to focus more extensively on IS and the associated staff processes.



## TECHNICAL OBJECTIVES FOR CID BOREALIS 2002

### DEMONSTRATION OBJECTIVES

- Baseline employed national equipment
- Place priority on workshop point-to-point testing
- Focus on military and commercial standards and on common operating procedures
- Provide a stable network for integrating various types of equipment
- Establish radio access point for interfacing combat net radio (CNR) into the switched network, focusing on data transmission
- Establish a coalition network during the exercise in order to force network problems to the surface
- Pursue solutions to interoperability
- Achieve the highest possible level of interoperability
- Address multinational frequency management issues

### NETWORK OBJECTIVES (CA)

- Integrate switch, transmission, LAN/WAN, information systems, end terminal devices and VHF/HF systems/equipment into the coalition tactical network
- Develop and refine network management procedures
- Use and evaluate network management automated tools
- Define guidance for establishing a WAN (routing tables)

### SWITCH SYSTEM OBJECTIVES (CA)

- Conduct point-to-point testing as the highest priority
- Conduct tandem testing
- Build an international circuit switch network
- Test end terminal equipment
- Test subscriber features (conference, call forwarding, call hold, etc.)

### TRANSMISSION SYSTEMS OBJECTIVES (UK)

- Use fibre/cable systems as primary means to interconnect switches
- Use other transmission systems to connect switches where feasible (radio relay, etc.)

### LAN/WAN OBJECTIVES (AS)

- Interconnect national LANs
- Establish a router based CID Borealis WAN using the coalition tactical network
- Provide access for national LANs into the CID Borealis router based WAN

### VERY HIGH FREQUENCY (NZ) /HIGH FREQUENCY OBJECTIVES (CA)

- Establish multinational HF/VHF voice and data network
- Extend CID Borealis LAN functionality over HF/VHF network
- Use HF/VHF network for telephone patching
- Test interoperability of nations' own modems
- Test Automatic Link Establishment (ALE)

### INFORMATION SYSTEMS OBJECTIVES (US)

- Conduct information systems (IS) interoperability testing in a controlled environment
- Migrate IS interoperability testing onto the WAN
- Include information assurance (IA) awareness
- Explore solutions to security problems in a multinational network

### EW (CA)

- Demonstration of selected national EW/SigInt Support capabilities with a view to promoting the same to the Op Community
- Test and evaluate ABCA EW/SS deployed comms interoperability from remote national locations
- Implement the ABCA deployed EW/SS concept
- Discover efficiencies with respect to ABCA Coalition access to / dissemination of information.
- Documentation of problems currently being experienced in operational theatres where documentation is difficult to achieve
- Documentation of interoperability issues associated with non-secure and secure domains
- Interoperability of national level EW/SS organizations with tactical level CIS organizations
- Familiarization of C2IS interoperability issues that can be expected during activity planned for 2004, including connectivity, data collection, data display, and data fusion
- Initial definition of an operational architecture information exchange requirements (IERs), including capture of EW IERs among nations

# Army Terminology Board

**T**he Army Terminology Board (ATB) is responsible to propose, develop, examine, approve and manage the standardization of Land Force doctrinal terminology.

To perform this mandate, the Board comprises subject matter experts, terminologists, translators, and representatives of the six combat functions (command, manoeuvre, information operations, firepower, protection and sustainment) from the Directorate of Army Doctrine (DAD), the Directorate of Land Strategic Concepts (DLSC), Public Works and Government Services Canada (PWGSC), the Directorate Information Resource Plans and Regulation (DIRPR), the Army Publishing Office (APO), and others as required. The Board meets periodically to review and approve terminology proposals submitted in support of evolving Canadian, NATO or ABCA<sup>1</sup> doctrine. The ATB is chaired

by DAD 2 (Deputy), and secretarial functions are performed by DAD 2-4 (Terminology).

Approved terminology is entered into the Army Terminology Repertoire, the Defence Terminology Bank, or submitted as a proposed term through DIRPR for NATO consideration. In this regard, the Canadian Forces (CF) is migrating from printed vocabularies and glossaries to using electronic tools. The Army has three primary electronic sources of information:

- **Defence Terminology Programme's Defence Terminology Bank (DTB)** – This tool is managed by DIRPR staff. The database is not completely populated; however, the ultimate goal is that this database will contain all CF terminology. <http://diso-s049.dndhq.dnd.ca:4712/>
- **Termium Plus** – This tool is managed by the Translation Bureau

and it supports a database for all terminology used and shared by federal government departments. It is a good tool, but users must appreciate that they will need to distinguish military from civilian terms. <http://termiumplus.translationbureau.gc.ca/tpv2Show/termiumplus.html?lang=e2>

- **Army Terminology Repertoire** – This tool is managed by the DAD 2-4 (Terminology) and serves as a database of terms reviewed, approved or deleted by the ATB. In this regard, it is the working tool to store evolving Army terminology. <http://lfdts.army.mil.ca/dad/Terminology/term.asp>



So what is the difference between a battle group and a battalion group? (Courtesy Combat Camera)

Army Terminology Board (ATB)			
Serial	Position	ATB Composition	Remarks
1	Chair	DAD 2 (Deputy)	• represents DAD
2	Secretary	DAD 2-4 (Terminology)	• preparation of ATB meeting • admin reqrs • establishment of funding reqrs • production of the minutes
3	French Reviser	Army Publishing Office (APO) representative	• ensure immediate response • highlight problems
4	English Reviser	Army Publishing Office (APO) representative	• ensure immediate response • highlight problems
5	Terminologist	Experienced terminologist from Public Works and Government Services Canada (PWGSC)	• preparation of reports on term status • safekeeping of adopted terms • maintenance of terminology bank • terminology research
6	Translator	Experienced translator from Public Works Government Services Canada (PWGSC) Translation Office	• direct support to the ATB • establish liaison with the PWGSC
7	DND / CF	Representative from Director Information Resource Plans and Regulation (DIRPR)	• representative
8	Members	DAD 4 (Manoeuvre)	• representative from each section • representative from DAT if required • representative from CLFCSC if required
9		DAD 5 (Information Ops)	
10		DAD 6 (Command)	
11		DAD 7 (Firepower)	
12		DAD 8 (Protection)	
13		DAD 9 (Sustainment)	
14		DLSC Representative	
15		DAT Representative	
16		CLFCSC Representative	
17	Observer	LFC OL Coordinator	

1. ABCA – American, British, Canadian and Australian Armies’ Standardization Program. New Zealand has observer status.



Last year the remains of several Canadian soldiers reported missing during the battle for the Kapelsche Veer, 26 – 31 January 1945, were discovered. One of them, Private V.G. Howey of the Lincoln and Welland Regiment, was interred at a ceremony at Bergen-op-Zoom Canadian War Cemetery, The Netherlands, in November 2001. The Lincoln and Welland Regiment bore the brunt of the fighting in this battle, where 89 officers and men were killed and 143 wounded. (Courtesy Commonwealth War Graves Commission)

# From the Directorate of Army Training

## Preparing for War: Revamping Collective Training in the Canadian Army

**Success in operations is directly related to the manner in which an army prepares itself for war. Training for war is the second most important activity an army undertakes; second only to war itself.**

by Major Jerry Walsh, CD  
Directorate of Army Training 7-2

**H**ave we as an Army embraced this philosophy, or have we merely been mortgaging risk, training to meet current operational commitments at the expense of producing truly combat-capable units and brigades in accordance with our assigned defence tasks? In recent years, the level and frequency of collective training conducted across the Canadian Army has declined considerably. Units have only received priority for training resources as a result of being designated for upcoming operational tasks. As a result, collective training has been mission focused and limited in scope. Combined arms training has been curtailed and brigade-level activities too often reduced to command post and computer-assisted exercises. So where does this approach leave us in terms of calling ourselves a combat-capable Army?

From a soldier's perspective it is a difficult situation to swallow. Morale has suffered as soldiers no longer practice, on a regular basis, the fundamentals of their trade. The warfighting spirit, which resides in the soul of every professional soldier, has been subdued by the reality of restricted resource allocations and increased task loads. Leaders at all levels, from junior non-commissioned officers through brigade commanders, once challenged under demanding field conditions, now conduct combat estimates in the comfort of simulation rooms and drill halls. The result is evident everywhere: in garrison, in the field and on current operations.

The fact is, Canada's collective training system as a whole has grown stagnant. Standards are applied with varying degrees of rigour and no true system of confirmation and validation exists. Resources are often secured by surreptitious means, with the best of intentions, but with a lack of corporate vision. The Canadian Army has not, as an institution, exploited collective training events to examine and refine our tactics, doctrine, equipment needs and the manner in which we prepare for war.

The recently published B-GL 300-008/FP-000, *Training Canada's Army* acknowledges the decline of warfighting professionalism across the Army. Until recently little has been done to stem this loss nor address the need to increase the level of collective training. The requirement is a simple one: to stem the decline of warfighting professionalism in the Canadian Army, with a view to enhancing our collective learning experience, over time, and working in a progressive and sustainable manner. In short, to design a collective training framework that is specifically focused on preparing soldiers, units and brigade groups for war. The Commander of the Army has clearly

articulated the Army's philosophy for collective training. Central to this philosophy is managed readiness, recognition that insufficient resources

***... Canada's collective training system as a whole has grown stagnant.***

and numerous tasks necessitate a tiered or cyclical approach to readiness, referred to as the Army Training and Operations Framework (ATOF).

The Army Training and Operations Framework is comprised of three tiered phases: a training phase, consisting of approximately ten months, during which time units will be assigned priority for training resources and protected from external tasks; a high readiness phase of twelve months duration during which time units may be assigned operational missions; and a reconstitution phase during which time postings and individual courses will receive priority. The culmination of the training phase will include participation in an Army-directed Brigade Training Event—the endstate of which will be the confirmation of individual and collective warfighting skills.



**Collective training was emphasized in the 1980s and early 1990s. Here troops conduct live fire training during an RV exercise. (Courtesy LdSH[RC])**



Formation-level collective training has suffered from a decade of intense international operations. The Army is now re-introducing brigade-level exercises. (Courtesy CTC)

Key to the success of the Brigade Training Event is the emphasis on the long-term, institutional benefits of conducting the training. The Army-directed Brigade Training Event caps the training phase of each ATOF cycle and will serve to focus the Army's resources to optimum effect. The scope of the training will facilitate a common institutional understanding of our tactics and procedures—even as we adopt new procedures and equipment suites—and, in an evolutionary manner, allow us to return to formation-level field training, so vital in promoting warfighting professionalism.

The primary training objective of the Brigade Training Event must be to provide a challenging and realistic field training environment to confirm individual and collective warfighting skills. It will also allow us to accomplish a wide variety of secondary institutional goals and objectives—including assessing the impact of modernization, experimenting with new force structures and testing new vehicles and equipment.

The Brigade Training Event is not simply a brigade-level exercise, or field training exercise. It goes well beyond that in terms of providing the focus for Canada's Collective Training Framework. The challenge is to strike a balance between the needs at the tactical, operational and strategic levels to gain maximum institutional learning, while underlining the importance of

maintaining the warfighting focus, consistent with the Army's assigned, operational tasks under the Defence Plan.

The requirement to capture lessons learned will be of paramount importance and will improve the manner in which we conduct after action reviews. Trained Observer Controller (OC) teams will be tasked to guide this process as we strive to extract lessons learned from all collective training events. In the

### ***The Brigade Training Event is not simply a brigade-level exercise or field training exercise.***

future, Weapon Effects Simulation (WES) will be integrated to support the confirmation and validation of training. The Canadian Manoeuvre Training Centre (CMTC), although still in its infancy, will take on a more prominent role in the design, conduct and confirmation of collective training.

During the training phase lead areas, brigades and units will benefit from a synergetic effort directed by Commander Land Force Doctrine and Training System to support, enhance, confirm and validate Army collective training. The Army Simulation Centre, Lessons Learned and Directorates of Army Doctrine and Training will work in concert to support tactical-level training objectives and define institutional and strategic needs. To be

successful this process must represent a collaborative effort from all interested parties, including the Land Force Doctrine and Training System, area headquarters and brigade and unit staffs.

Only the complexity inherent in synchronizing the varied components of combat power, on a significant scale, beyond the relatively familiar unit focus will aid in restoring a sense of warfighting professionalism within Canada's Army. Only in a sustained and challenging brigade framework can we hope, over time, to rebuild our ability and confidence to direct complex operations of land forces in contingency and coalition deployments.

Collective training at the brigade level in a field training environment is the first level at which a true synergy of all arms co-operation is realized. The Brigade Training Event will instill confidence, foster cohesion and deliver combat readiness. It is the venue for Canada to demonstrate its military competence as an Army, while producing experienced commanders and staff, comfortable in the exercise of command and control of significant forces, capable of utilizing the full range of intelligence resources, communi-

cation suites and decision support tools.

As the annual culmination of ATOF and the centrepiece of Canada's Collective Training Framework, the Brigade Training Event will represent a formidable challenge to the leaders and soldiers who will confidently go forth on the battlefields of tomorrow. Physically and mentally demanding from start to finish, the Brigade Training Event will, in years to come, gain a reputation equal to any world-class warfighting collective training experience.



*Update prepared by Major Jerry Walsh, CD.*



# From the Directorate of Land Force Readiness

## Army Training and Operations Framework – Understanding Managed Readiness or ATOF for Dummies

*In the army today, sustainability is the area that concerns me most. Current structure has a greater inherent resource requirement than there are dollars available. At the same time, personnel demands continue to exceed current personnel capacity. The consequence of this imbalance is an increased operational tempo, which leads to a high personnel tempo as soldiers are assigned an ever-increasing number of tasks. This imbalance in resources and people must be resolved and it is my principal focus to do so.*

–Lieutenant-General M. Jeffery,  
Chief of the Land Staff<sup>1</sup>

Since the end of the Cold War, the Canadian Army's operational tempo has increased to a point that has only been surpassed by our previous commitments to large wars. In a world where the trends have moved from a predominance of inter-state conflict to one of intra-state conflict, Canada will likely be expected to participate in an increasing number of peace support operations. Given this consideration, combined with the increasing threat of terrorism and asymmetric warfare, the Canadian Army cannot afford to be caught off guard. It is now more important than ever, to "Stand On Guard For Thee"<sup>2</sup> or *vigilamus prote*.<sup>3</sup>

With an increase in operational commitments, we have also experienced a serious decrease in financial support for the implementation of Canadian defence policy. The resulting dilemma has necessitated a shift in the focus

of the Army leadership to manage readiness in a more deliberate fashion than in the past. While the Canadian security situation is unique, the general problem is one we share with our allies, including the United States. The risk of inaction is the potential that we will be unable to meet our Defence Plan (DP) commitments, something our United States allies have also realized: "If we do not do something, we run the risk of a return to the hollow Army and a risk of not being able to execute our national strategy."<sup>4</sup>

The aim of this update is to explain the concept of managed readiness and how the Canadian Army will achieve it through the Army Training and Operations Framework or ATOF. This explanation of managed readiness will commence with a review of the historical context of the problem. It will be shown when the concept of managed readiness first became topical and why it was

### ***Managed readiness relates directly to the need to make good decisions in complex situations.***

necessary to consider it as a remedy to the Army's challenges. The constraints and restraints will then be discussed, as these provide the basic framework within which the Army can operate to achieve managed readiness. The basic construct of a managed readiness framework will then be outlined, followed by a description of how it will work in practice. Having described the ATOF concept, this update will then show how the managed readiness system

fits into the Army Campaign Plan, as a line of operation that achieves a specific decisive point. Fundamental to understanding managed readiness will be a discussion of how the Army intends to effect the strategic implementation of ATOF with a view to ensuring the required readiness is achieved.

#### Historical Context

*The essence of ultimate decision remains impenetrable to the observer—often, indeed, to the decider himself ... There will always be the dark and tangled stretches in the decision-making process—mysterious even to those who may be most intimately involved.*

–John Fitzgerald Kennedy<sup>5</sup>

Managed readiness relates directly to the need to make good decisions in complex situations. It is meant to serve as a decision aid that helps bring order to the strategic framework and deliberation to the readiness process. Managed readiness as we know it today first appeared on the Canadian scene in 1992 at Force Mobile Command in St-Hubert.

Although some preliminary analysis took place at that time, the concept never matured into an implemented formal system.

The requirement for managed readiness was again highlighted during a training conference held in the fall of 1997 in Cornwall, Ontario. The Army Training Authority (the predecessor to the Land Force Doctrine and Training System) held this conference to

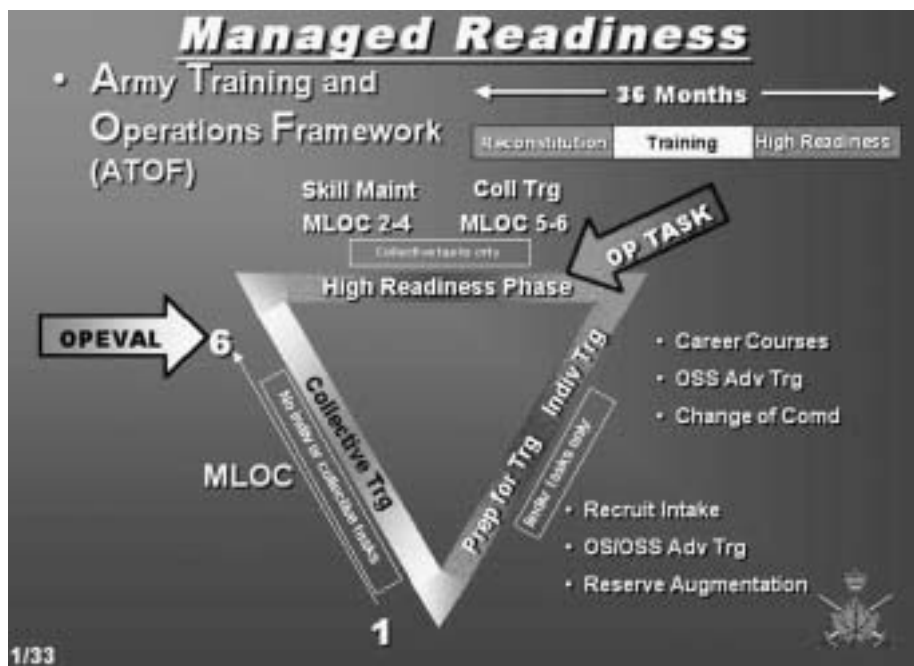
ascertain the most pressing issues concerning training from across the Army. The Army senior leadership very clearly identified that more central management of tasks to resources and of operational and personnel tempo should be a priority. A direct result of these concerns was the establishment of the Army Training Cycle – New Model. This model was accepted by Army Council on 23 July 1998 and approved by the Chief of the Land Staff (CLS) with no formal objections. The New Model was the first version of what we now call ATOF. Since 1998, implementation of the managed readiness system has been hampered for several reasons, but the Army is now in a position to execute the concept.<sup>6</sup>

The purpose of ATOF is to provide much needed strategic management of the Army's readiness. In the past this readiness could be managed with little effort, as there were adequate personnel, resources and time to keep a large number of army units at a higher level of readiness. "This gave us a greater ability to respond to any task and still have the depth to share the operational and tasking load evenly across the Army."<sup>7</sup> Despite improvements to the management process having been effected during the reduction in force structure over the past several years, the resulting levels of

## ***ATOF will serve as a strategic framework within which the Army's commitments will be assigned.***

readiness are not currently adequate: "... while we have become more efficient, our management of army readiness is still not meeting our needs."<sup>8</sup>

ATOF will serve as a strategic framework within which the Army's commitments will be assigned. That framework will clearly illustrate the state of readiness of all units in the Army at any given time. It will help bring order and deliberation to the readiness process and, in doing so, it will improve the Army's overall resource management, thus resolving the current imbalance of resources throughout the system.



**Figure 1. The Army has undertaken several initiatives to improve sustainability. ATOF is a tiered readiness approach. All units in the army will fall into one of three tiers - reconstitution, training or high readiness. This framework will allow for a predictable training sequence and ensure readied units for commitments and contingencies.**

### **CONSTRAINTS AND RESTRAINTS**

When planning such an undertaking, it is important to take note of the external and internal limitations to the organization that is trying to improve its readiness. There are many constraints and restraints<sup>9</sup> that are either imposed on the Army from above or

- *participate in multilateral operations anywhere in the world under UN auspices, or in the defence of a NATO member state, and, to that end ... be able to deploy three separate battle groups or a brigade group ... and earmark an infantry battalion group as either a stand-by force for the UN, or to serve with NATO's Immediate Reaction Force.*<sup>11</sup>

Meeting the DP commitments is clearly something the Army must be ready to do. Therefore, it is a central and basic constraint in the development of any managed readiness framework.

There is little doubt that high-quality soldiers are an imperative to maintaining readiness. Retaining high quality soldiers can, however, become difficult during times of increased operational tempo; "Frequent deployments, promotion slowdowns due to budgetary constraints, and a perceived loss of health care and retirement benefits have the potential to increase uncertainty and adversely affect retention."<sup>12</sup> Ensuring that operational tempo does not exceed the soldier's reasonable expectations requires a

internally mandated to ensure a specific critical path is maintained at an appropriate level. Understanding these limitations is critical to understanding how the managed readiness framework is applied to the ATOF concept. The first and arguably the most important constraint, is the requirement to meet the DP commitments outlined in the 1994 White Paper.<sup>10</sup> Those commitments for the Army include the following:

- *maintain the capability to assist the Department of Foreign Affairs and International Trade in the protection and evacuation of Canadians from areas threatened by imminent conflict; and*

specific process. Soldier day methodology will be used to ensure soldiers continue to contribute to overall readiness rather than detract from it.

Soldier day methodology is a calculation of the number of days a soldier can be employed, after considering time for leave, statutory holidays and weekends, within a given state of readiness. In general, in periods of high readiness, a soldier is available for 269 days of employment in a given year. In periods consisting of a training cycle, soldiers would be available for employment 218 days in a given year. Finally, during periods of re-constitution or low readiness, soldiers would be available for employment no more than 167 days per year. This methodology is fundamental to the proper implementation of a readiness framework. It will be important for leaders at all levels to monitor this methodology, ensuring the readiness framework will continue to function effectively.

Linked to soldier day methodology are the manning levels that determine how many soldiers will be available during specific periods of readiness. The Army is currently manned at 93% of its authorized level. This is expected to decline to 88% by 2005, a result of aging of the force and service policies for recruitment and retention. VCDS guidance is that operationally-tasked

units and units designated to be in a high state of readiness are to be manned at 100% of their task organization and equipment (TO&E). Other field force units must be manned to a minimum of 92% of their TO&E.<sup>13</sup> Ensuring these constraints are met within the context of a framework of managed readiness will require a deliberate strategic personnel manning plan. This manning plan is, therefore, an integral part of the ATOF Master Implementation Plan. It will focus on ensuring the appropriate manning priorities are given to the units who need them.

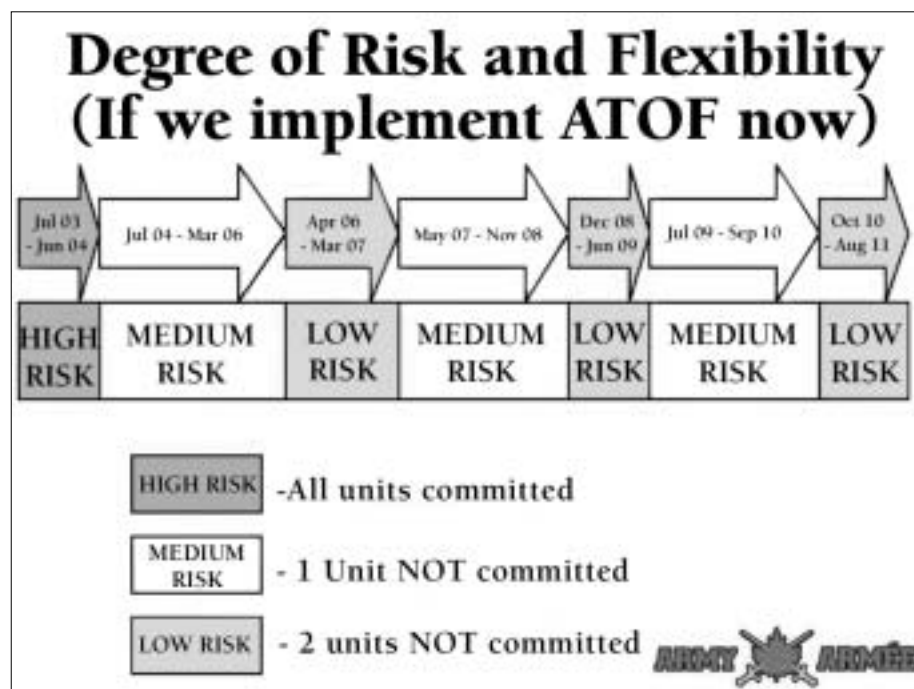
The managed readiness framework is not set up for the sole purpose of operational readiness. The framework will also help the Army to achieve the appropriate level of training at the unit level within a brigade context, an experience that has been missing from the Canadian Army since the early 1990s. To achieve the Level 6 training requirement, there is a need to establish a core group that will train each year. ATOF has done this to ensure that each brigade training event (BTE) includes the full spectrum of army troops for a specific training event. Therefore, the core group in each case will consist of two mechanized infantry battalions (from different areas), one light infantry battalion, one armoured regiment (with at least one recce squadron and

one tank squadron), one artillery regiment (minus), one engineer regiment (minus), one service battalion, and one signal squadron. Ensuring that this core group trains at least once at the brigade level within each ATOF cycle is key to ensuring the Canadian Army continues to be a relevant fighting force.

Training of the Army must also dictate other constraints, not the least of which is the management of Franco instructors to achieve the required level of training in the Secteur de Quebec. To do this, the managed readiness framework must ensure that at least two infantry units from 5<sup>e</sup> Groupe-brigade mécanisé du Canada are in a Reconstitution and Support Phase during each summer. This is the only way in which the Army can achieve the critical mass of French instructors required to conduct infantry training each year. Therefore, it is a constraint that must be considered in any variation of a managed readiness framework.

Finally, the implementation of managed readiness must be conducted in a timely manner to ensure that it continues to support the Army campaign plan. Given that managed readiness is a decisive point to be achieved within the campaign, a failure to meet this requirement could in turn delay the achievement of the Army's aims. With this end-state in mind, the concept of managed readiness must be achieved by 2006. The extended implementation phase recognizes the limitations imposed by a variety of legacy activities that cannot be ideally aligned to the selected managed readiness framework.

Given all that must be done to support a framework of managed readiness, there are also some restraints to ensure that certain aspects of campaign planning and equipment acquisition are not ignored. Firstly, it is important that the overall concept of the managed readiness framework is not ignored. Within the framework, there are set periods of time for selected units to conduct reconstitution and training with a view to being at a state of high readiness for a given period of time. Breaking the ATOF cycle will affect the overall integrity of



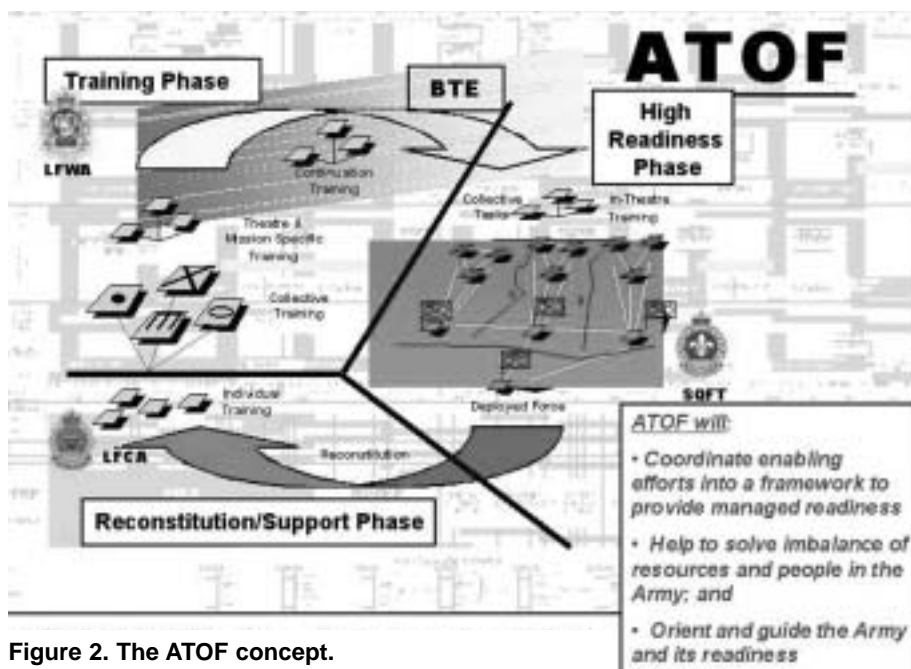


Figure 2. The ATOF concept.

managed readiness. As a result, it is paramount that units adhere to the cycle. While the ATOF cycle must be followed, the Army can ill afford to delay the issue of any new equipment. Efforts will be made to ensure that equipment deliveries are contracted to occur when units are in their Reconstitution Phase. However, there will be no delay of equipment issues during the ATOF implementation phase through to 2006.

#### THE ATOF CONCEPT

**K**ey to understanding the concept of managed readiness is an understanding of the framework that helps maintain that readiness. In the case of ATOF, the concept can be visualized by imagining the three sides of a triangle. The triangle contains the three phases of Reconstitution and Support, Training, and High Readiness, all measured both in terms of time and specific achievement of established goals. One entire cycle (three phases) of ATOF will take 36 months to complete.

The first phase in the ATOF concept is Reconstitution and Support, which will begin in July and end 14 months later, at the end of the following August. During the Reconstitution and Support Phase, individual training is the primary task. While collective training may take place during this time, it is limited to the

platoon level. This is the time in which personnel complete their career courses, change commanding officers, and conduct army individual tasks. This phase lasts until August, allowing new personnel to arrive before transitioning to the Training Phase.

The second phase of ATOF is Training. During this phase the emphasis is collective training at the company, unit and brigade level. No individual or collective tasks will be assigned to a unit that is in the Training cycle. The phase will culminate in an operational evaluation that is conducted as part of the BTE. During the ATOF transition period, the BTE will take place in various locations; however, the desired end-state is to have the BTE regularly executed in Wainwright at the future Canadian Manoeuvre Training Centre (CMTC). The Training Phase is 10 months in duration and will end annually in June.

The final phase of ATOF—High Readiness—will come after successfully completing the operational evaluation at the end of the Training Phase. The High Readiness Phase will last for 12 months, making the time to complete all three phases a total of three years. During the High Readiness Phase, units will be prepared to conduct an operational task as part of the Army's DP commitments. The operational task could be a six

month deployment to Bosnia or it could be a year waiting to be deployed as part of NATO's Immediate Reaction Force (Land) (IRF[L]). Within the ATOF framework, there will be units that are in a high state of readiness, not committed to a DP task. These units will be used to conduct follow-on rotations for Bosnia, enhance IRF(L) commitments or to take on non-forecasted tasks in support of any new Canadian contingencies. In any case, these units will provide the Army with an enhanced level of flexibility, reducing the risk to our operational and personnel tempo while at the same time increasing our ability to react to the unforeseen.

#### WITHIN THE CONTEXT OF THE ARMY CAMPAIGN PLAN

**T**he concept of managed readiness is certainly part of a greater plan to drive the Army forward in the new millennium. The campaign plan to achieve army objectives is made up of building blocks that translate into lines of operation focused on achieving the aims of the Army. The long-term objectives include: Connecting with Canadians, Shaping the Army Culture, Fielding a Combat-Capable and Sustainable Force Structure, and Managing Army Readiness. The campaign end-state will be achieved when a sustainable force structure and operational/personnel tempo have been realized.

The building blocks to achieve the Army end-state consist of leadership, personnel, doctrine, organization, operations and training, infrastructure, and equipment. Each of these building blocks has and will be used to conduct five lines of operation that are central to the Army's campaign plan. The lines of operation are as follows:

- lead change and foster trust
- Land Staff personnel strategy
- Army of Tomorrow model
- manage readiness
- modernization

Each of these lines of operation is connected by decisive events that must be achieved to ensure successful execution of the Army campaign. Achieving managed readiness is, in itself, a decisive event within the Army



**Figure 3. Managing Army Readiness. Canadian soldiers deployed in Afghanistan.**

campaign plan. It is a specific, long-term objective of the Army and will be a critical requirement to attaining the end-state of a sustainable force structure and operational/personnel tempo. Given the key role of managed readiness within the context of the Army campaign plan, it is a line of operation all commanders must adhere to in executing their respective tasks and assignments.

#### STRATEGIC IMPLEMENTATION OF ATOF

*When contemplating the task of strategy implementation it is imperative to consider its underlying components: structure, incentives, staffing and decision making. Given the transformational nature of ATOF, relevant decision enablers establish that priority attention be given to incentives, with the remaining in a supporting role.<sup>14</sup>*

The strategic implementation of ATOF is a complicated endeavour given the transformational nature of the process. Discipline must be exercised in the implementation of ATOF to ensure that the goal of managed readiness is achieved. Proper incentives for implementing ATOF must first be put in place and then supported by the additional enablers of staffing, structures and decision-making. Finally, during the implementation process itself, specific enabling efforts must be

put in place and monitored closely to ensure a comprehensive and complete approach to achieve managed readiness.

With regard to incentives, the attainment of managed readiness is indeed a clear and achievable goal. Expectations are defined in the ATOF Master Implementation Plan, and consistent measurements will be used to monitor success. The end-state is clear, and the framework provides for the insertion of specific decision points to achieve goals within the established framework. The most important incentive in the implementation of ATOF is that a system of managed readiness must be applied to the Canadian Army before it collapses under the weight of the current operational burden.

When staffing the ATOF Master Implementation Plan, new approaches were taken to achieve managed readiness. Firstly, a basic level of risk will be accepted, particularly in the transformational stage of implementation. The risk has been mitigated to the greatest extent possible, but some units will have to endure a period of transformation that will be more disruptive than that for other units. ATOF implementation will also allow for reactive and improvisational approaches to the

concept of managed readiness. For example, ATOF is being implemented knowing that the structure of the Army could change within the transformation period. ATOF will have the flexibility to adopt to a new model for the Army if necessary. Future planning within the framework of managed readiness will be based on results in the early stages of implementation. In keeping with this concept, at the outset, ATOF will favour a more generalist vice specialist outlook.

The proper structure for the most effective implementation of ATOF has yet to be determined: "To paraphrase Frederick the Great's remark about commanders, the ideal command system, like Plato's Republic, exists only in heaven."<sup>15</sup> Given the elusive nature of the perfect structure, general principles concerning structures will be considered when implementing ATOF. Where possible, continued staff advancement and rapid responses will be achieved by streamlining the overall structure. Furthermore, it must be anticipated that the structure will likely change, resulting in an inconsistent

### ***Discipline must be exercised in the implementation of ATOF...***

flow of information. Given these considerations, all levels of leadership will be relied upon to ensure the integrity of ATOF is maintained under the heavy burden of the transformational process.

With regard to decision making within ATOF, information must be shared widely, while ensuring the Army is focused externally. The external focus is required to ensure that managed readiness is maintained to meet the DP tasks assigned in the *White Paper*. The managed readiness framework provided by ATOF implementation should allow for an increased level of spontaneity in decision making at all levels. The framework provides a clear picture of the Army's managed readiness and, therefore, appropriate decisions should be self-evident.

To realize a system of managed readiness, the CLS has established several enabling efforts that will thoroughly support ATOF implementation. The seven enabling efforts, as written in the draft ATOF Master Implementation Plan, are presented below with a brief description of each:

**Operational Demand.** *Current commitments have exceeded the Army's sustainable limit. Therefore, the Army will continue to pursue strategies that subscribe to the 4:1 rotation ratio. Specifically, force packages will adhere to existing organizations wherever the threat scenario permits. Also, we will further develop operational commitment rationalization efforts to better optimize the entire Army while ensuring the operational focus remains on units designated as High Readiness in accordance with ATOF.*

**Taskings.** *This activity has not only grown over the years but represents one of the greatest dissatisfiers in terms of QOL [quality of life] and unit cohesion. Simply stated, the tasking bill must and will be reduced. In concert with the individual training programme, tasking demand across the Army will be re-aligned to available capacity as identified by ATOF and Soldier Day methodology. No longer will the demand-side dictate the outcome of our soldiers' disposition. Starting in 2002 task planning will be based on the identification of the available supply, after which training demand will be ascertained and capped. Furthermore, geography and the use of the Reserve Force component will be maximized. Lastly, new approaches to individual training that reduce augmentation requirements will be developed and utilized at all levels.*

**Equipment Fielding.** *Ongoing modernization efforts and continued operational effectiveness demand that many equipment-related activities cannot be immediately influenced by ATOF. However, the synchronization of equipment fielding and the status of the Field Force is an integral component of managed readiness. By design, equipment fielding to the Field Force is scheduled for the Reconstitution and Support Phase. With the sole anticipated exception of LAV 3, this strategy will be realized starting with LFWA in 2003. Vehicle Fleet Management will also be aligned to ATOF.*

**Personnel Support and Policies.** *The Army's present manning situation is unacceptable. The Army will pursue a new approach towards mitigating the manning dilemma while concurrently furthering the growth required of an under-strength Force. The Army expects to witness a downward trend until 2005, stabilizing at an estimated 88% overall manning level; not until 2010 is the manning level expected to approximate 100%. Therefore, new manning levels will be incrementally introduced to the Field Force based on achieving near-term results in concert with ATOF criterion [sic]. This will apply to both operationally designated units as well as selected units based on geographic factors. In addition, the Army must re-examine policies regarding medically-restricted personnel. With approximately 10% of the Field Force medically categorized, the subsequent workload has been absorbed by a disproportionate few.*

**Army Transformation.** *The Army will continue to transform to meet the demands of a changing strategic environment. Force structure and weapons system management planning will complement ATOF. As these initiatives progress, management practices must be capable of responding to the demands of managed readiness in a cost-effective manner. PY conversions will be coordinated with the ATOF manning implementation plan.*

**Training.** *The cyclical nature of ATOF reflects the cyclical and graduated nature of training. It is incumbent upon all of us to ensure that we remain disciplined towards the training methodology imbued within ATOF. Each ATOF phase clearly details the corresponding training activities. Low training levels are equally important to the overall managed readiness challenge as high readiness levels. By 2005 all LFAs will have experienced at least one full ATOF training cycle. Continuous feedback during this time-period will ensure training activities match ATOF requirements and resourcing imperatives.*

**Fiscal Imperatives.** *The realities of managed readiness will require a redistribution of financial resources. The scope of this impact will be key to the Army's overall fiduciary responsibilities. Matching financial resources with ATOF-driven training levels is only one*

*aspect of the challenge; costs related to manning and equipment issues, modernization, heightened Reserve Force participation throughout the Army, and enhanced CSS requirements to meet readiness obligations represent considerable pressure on an Army already underfunded and attempting to more responsibly address its sustaining agenda.<sup>16</sup>*

## CONCLUSION

The Canadian Army's operational tempo is barely sustainable given the limited size of the force. The increase in operational tempo combined with the decrease in defence funding necessitates a system of managing Army readiness.

This update has explained the concept of managed readiness and the framework that the Canadian Army will use to achieve the desired level of sustainable readiness. Since 1992, ATOF and its predecessors have been a potential solution to the Army's challenges. It will be implemented in full by 2006. The framework will allow for three distinct levels of readiness within the Army, with units cycling through each readiness tier at least once every three years. The cycles will consider time required for reconstitution, completion of assigned tasks, conduct of training for war, and deployment on operations. The end-state of ATOF will contribute to the Army Campaign Plan end-state by achieving sustainable force structure and operational/personnel tempo.

For the foreseeable future, the Canadian Army will require a system of managed readiness to prepare it for war. Canada's ability to respond rapidly in diverse and wide ranging missions depends on this readiness. ATOF will achieve this goal. Once implemented, it will also provide some much-needed relief in the operational/personnel tempo that is increasingly weighing down our small but capable force.



Update by Major André Corbould, CD

## ENDNOTES

1. LGen M. Jeffery, Comments to the *Standing Committee on National Defence and Veteran Affairs – State of Readiness of the Canadian Forces*, Dec 2000. See internet: [http://www.army.forces.ca/LF/sps/scondva\\_e.htm](http://www.army.forces.ca/LF/sps/scondva_e.htm), p. 3.
2. Line from Canadian national anthem.
3. Army Motto (unofficial).
4. Reimer, General Dennis J. quoted in Mark E. Vinson, "Structuring the Army for Full Spectrum Readiness," *Parameters: US Army War College Quarterly*, Summer 2000, p. 19.
5. John Fitzgerald Kennedy, quoted in cover of Graham T. Allison and Philip Zelikow, *Essence of Decision: Explaining the Cuban Missile Crisis*, 2nd Edition, New York: Addison-Wesley Educational Publishers Inc., 1999, inset.
6. Much of this general background was provided in an interview with Col W. Brough, 22 March 2002.
7. LGen M. Jeffery, Comments to the *Standing Committee on National Defence and Veteran Affairs – State of Readiness of the Canadian Forces*, p. 5.
8. *Ibid.*
9. Constraints are defined as things that must be done while restraints are defined as things that cannot be done.
10. Government of Canada, "1994 Defence White Paper" in Douglas Bland, *Canada's National Defence – Defence Policy*, Vol. 1, Kingston: School of Politics Studies, 1997.
11. *Ibid.*, p. 344.
12. United States Army, *Army posture Statement 1998*, Chapter 4, p. 1.
13. Chief of the Land Staff, *Army Training and Operations Framework Master Implementation Plan* (Draft), March 2002, p. E-1.
14. 3000-8 (DLFR) *Planning Directive 010-01 – Army Training and Operational Framework (ATOF)*, July 2001, p. 1.
15. Martin Van Creveld, *Command In War*, Cambridge: Harvard University Press, 1985, p. 261-262.
16. Chief of Land Staff, *Army Training and Operations Framework Master Implementation Plan* (Draft), March 2002, p. 3.



Exercise Balkan Gunner was a seven-day Multinational, Offensive Support Group exercise conducted by Multinational Division (South West) from 12 to 18 May 2002, at Resolute Barbara Range in Glamoc, Bosnia and Herzegovina. The exercise included participants from Canada, the United States, the United Kingdom and the Netherlands. During the airlift component of the exercise, members of Q Battery, 5<sup>e</sup> Régiment d'artillerie légère du Canada fired their LG-1 105 mm Howitzers. (Photo by Cpl Grant Rivalin, HQ MND SW Media Production Team)



# Leadership Training in Basic Army Officer Training

by Officer Cadet Kristina Reashore

I recently finished Phase II - Common at CTC Gagetown. Having previously been in the MARS (maritime surface) trade, I found this experience to be quite different from what I had known. From weapons classes and digging trenches, to patrolling and section attacks, it was perhaps one of the most interesting and challenging courses I have completed. Not only was the course physically demanding, due largely to the lack of sleep, it was also an opportunity to develop some of my leadership and management skills. Upon returning to RMC that fall, I took a course in leadership and motivation as part of my academic curriculum. It seemed to me during my academic course on leadership that much of what we had been taught on Phase II - Common was actually management, not leadership. My experiences with leadership training in Gagetown and leadership education at RMC have led me to reflect on junior leader development in the Army, and this paper is the result of that reflection. The points I wish to argue are that (a) management and leadership are different, important parts of the Army officer's role, (b) Phase II - Common focuses on

***...leadership is the primary reason for the existence of all officers...***

teaching management not leadership, and (c) there are a number of relatively simple, inexpensive initiatives which could enhance the leadership training of Phase II - Common.

## LEADERSHIP VS MANAGEMENT

As pointed out in the CF leadership doctrinal manual, *The Professional Officer*, leadership is the primary reason for the existence of all officers of the

Canadian Forces. Yet leadership and management remain two somewhat ambiguous concepts when discussed together.<sup>1</sup> By itself management can be

defined without difficulty, but this definition can become blurred when it is compared with the concept of leadership. In the Canadian Forces, and especially in the Army, the term "management" carries a negative connotation, as it does outside the military.<sup>2</sup> Most army officers do not want to be perceived by their troops, or even think of themselves, as *managers*. They prefer to be portrayed and perceived as leaders or even as commanders. It is, therefore, important to distinguish leadership from management in order to clarify some of the possible misconceptions that may exist.

As defined by Northouse, management involves producing order and consistency through planning, budgeting, organizing, staffing, controlling and problem solving.<sup>3</sup> By this definition, there should be no negative undertones associated with the idea of management. Rost suggests that it is time to stop the denigration of management and begin to rethink its nature and its necessity.<sup>4</sup> He also suggests that if you want to see how much people value management, "deliver the payroll checks late, and decrease the supplies that people need for their jobs."<sup>5</sup> Management is an important part of supervisory positions, as it involves getting the work done in an orderly fashion. It may not present as many opportunities for glory, but it is, nonetheless, crucial in the efficient

functioning of organizations. A perusal of the average army officer's responsibilities shows that many involve management tasks. Most of the work carried

***Most army officers do not want to be perceived by their troops, or even think of themselves, as managers.***

out in garrison is probably managerial in nature, yet is rarely referred to as such. Examples like paperwork, checking on vehicle maintenance and allocating resources are all management tasks. In fact, management is the behaviour that is exercised most of the time in an officer's career.

Leadership cannot be defined as easily. There are most likely as many definitions of leadership as there are leaders.<sup>6</sup> Rost found 221 definitions of leadership in his review of leadership literature.<sup>7</sup> The more leadership is examined, discussed and researched, the less obvious its definition becomes. Northouse describes leadership as producing change and movement through vision building, strategizing, and aligning people, communicating, motivating and inspiring.<sup>8</sup> All of these actions seem to literally inspire by their very nature. Regardless of the leadership definition one accepts, the fact remains that its applications are different in all circumstances. The Canadian Forces' definition of leadership—the process of influencing the behaviour of others in order to accomplish a mission in the manner desired by the leader<sup>9</sup>—is perhaps more general, yet equally as relevant. Leadership behaviour is strongly encouraged, yet there are no definite guidelines as to how one should become a leader. A common theme that runs through the writings of many authors, however, is that leadership is generally seen as an influence



**Must leadership training incorporate leadership and management? (Courtesy CTC)**

process that energizes followers.<sup>10</sup> Influence can extend over long periods or it can be quite limited in duration, occurring only for a minute or two. Leadership can thus be said to consist of intervals of behaviour while management is being carried out. According to Kotter, leadership is an innovative function aimed at coping with change. Vision, inspiration and respect are some of the intangible factors that a leader can bring to his/her followers.<sup>11</sup> These factors may not be constantly present, but are called upon and demonstrated as required.

Most of an army officer's work involves managing people and resources. The infantry platoon commander's mission of taking a piece of ground requires the formulation of a plan according to the resources and troops that are available. Deciding on routes and attack formations and making contingency plans are management tasks for this platoon commander. Inspiring soldiers to accept the plan and execute it vigorously in the manner desired by the commander requires leadership. The plan (i.e., management) may dictate part of the success of the mission, but may not actually inspire the soldiers to accomplish the mission. The missing element in this case is the officer's leadership. The example that an officer portrays and the manner in which troops are addressed are important leadership behaviours because they have the potential to influence the

followers. The balance between leadership and management becomes the determining factor in the successful completion of the mission, for without both good management and good leadership abilities, the platoon commander would fail. Consequently, the issue of training and development of these behaviours becomes a crucial topic of discussion.

#### **EVALUATION OF PHASE II-COMMON (ARMY LEADERSHIP TRAINING)**

The most basic leadership training for future army officers, Phase II - Common, occurs over a seven-week period at Area Training Center (ATC) Gagetown. During this time, candidates are required to assimilate the theory behind the operational doctrine of commanding a dismounted infantry

section. They are expected to complete several field exercises using the knowledge they have learned in class as well as the leadership skills they possess. Candidates are also expected to not only achieve, but exceed, the standard. In these seven weeks, candidates are supposed to develop their leadership skills.

The question I have about this training, however, is whether this course is truly developing leadership or simply teaching management skills? My impression is that Phase II - Common is largely an exercise in managerial skill acquisition. As a means of exploring leadership development possibilities for Phase II - Common, I have chosen DuBrin's analytical framework.<sup>12</sup> In his book on leadership, DuBrin discusses leader development in terms of individual self-development processes (e.g., self-awareness and self-discipline) as well as methods of training and development (e.g., education, experience and mentoring). I believe that this framework can be applied to military leader development and will now relate my experiences on Phase II - Common against DuBrin's thoughts on self-awareness, self-discipline, education, experience and mentoring.<sup>13</sup>

The development of leadership through self-awareness is the insightful processing of feedback about oneself to improve personal performance and effectiveness. Muchinsky emphasizes that enhanced self-awareness is one of the foundation blocks for management and leadership development programs.<sup>14</sup> In DuBrin's framework, leadership development through self-awareness involves feedback loops. He states that a single feedback loop occurs when an individual seeks minimum feedback, whereas a double feedback loop is a more in-depth examination of values and goals that are part of an individual.<sup>15</sup> Phase - II training involves a minimum amount of self-evaluation. The directing staff provides most feedback through weekly assessments as

***... there are no definite guidelines as to how one should become a leader.***

well as more formal evaluations. Nowhere in the training plan or in the course is self-evaluation encouraged or even mentioned. Debriefs are given after tasks have been completed without much input from the student in question. There are no opportunities, other than self-initiated instances, for the candidate to take the time to



**Leaders must be exposed to a variety of styles and methods to be ready for the challenges they will face. (Managing Editor's Collection)**

analyze his/her performance in the various command roles. There is, however, a presentation of the personnel appraisal system, which introduces candidates to the idea of evaluating their troops, but this presentation is not enough to truly convey the importance of self-awareness for a leader.

Leadership through self-discipline involves an individual taking an active and vigilant role in his/her own development. For DuBrin, self-discipline is the mobilizing of an individual's effort in order to remain focused on attaining a goal.<sup>16</sup> Although not explicit in Phase II - Common, self-discipline remains a crucial part of leadership within the Army. Self-discipline involves directing one's effort to remain focused on the task at hand or on a goal in a non-task oriented setting. The directing staff of Phase II - Common constantly emphasizes this core trait. Perseverance and the ability to stay focused are also key traits that are emphasized, especially when training becomes more intense. The training plan is satisfactory in its attempt to stress discipline and self-discipline. It combines both of these concepts in one lecture, followed by two periods of group discussions. This format and the level of emphasis given to the subject is likely effective for the assimilation of such information.

The bulk of leadership development, according to DuBrin, occurs through education, experience and mentoring. For him, education refers to the acquisition of knowledge without concern for its immediate application.<sup>17</sup> Phase II training is mostly based on the direct application of doctrine that is taught in the classroom. Candidates learn the theory and immediately apply it in a practical setting. The focus of the course is thus on training; education is left for another time. ROTP/RETP students attend university throughout the year, while direct entry officers have already obtained their undergraduate degrees. Although the knowledge gained from education may certainly improve one's problem solving skills, it is assumed by the staff that this education has already occurred. The leadership material that is taught during Phase II, however, relates mostly to leadership principles. The subject matter outlined by the training plan involves only a shallow look at leadership and related concepts. For example, there are only two 40-minute lectures devoted to "Army Leadership." This amount seems quite low considering that Phase II is intended to be a basic leadership course. The confirmation method for this section—a written test—is also questionable. This examining method does not seem appropriate for the subject matter—leadership is not learned on paper, for the most part.

Experience allows an individual to convert knowledge into skills.<sup>18</sup> Learning from other candidates as well as from the task itself is perhaps the most effective way to learn leadership skills. Feedback is most effective when it derives directly from the work itself according to Hackman and Oldham.<sup>19</sup> Phase II allows candidates to gain a certain amount of experience through practice. Conducting several section attacks before the evaluation, for example, allows a candidate to get direct feedback on how he/she is doing and to learn from his/her mistakes. He/she can develop the confidence needed to command as well as build on the managerial abilities needed to coordinate the activities of his/her subordinates. The numerous attacks allow candidates to learn from their course mates' mistakes as well as successes. Experience with difficult training prepares candidates for the unpredictable. Interpersonal relationships are also an integral part of this training because of the experience gained in dealing with many different types of people during a given task. There is, however, no formal emphasis placed on taking the opportunity to learn as much as possible from other candidates. If one is fortunate enough to have staff that will highlight this point, the process of learning is enhanced. Otherwise, this opportunity is missed.

Another experienced-based way to develop leadership capability is to be coached by a knowledgeable leader.<sup>20</sup> Coaching and mentoring are central to leadership training for Phase II. Both aspects are part of the lesson plans involving leadership. Though coaching and mentoring are arguably the most important means for developing leadership during this training, they are not necessarily experienced in the classroom. The bulk of coaching occurs through warrant officers and senior non-commissioned officers being directly involved in candidate training. From what I saw on Phase II - Common, sergeants try to impart their knowledge and experience to their section members. They also affect candidates' training simply by being examples. The course officer is another model that candidates learn from. The course

officer may not have as much contact with the candidates but will, nevertheless, leave an impression. Coaching is mostly done through observation and feedback. Though informal, it is probably the most important form of leadership development that occurs in Phase II - Common.

#### IMPLICATIONS FOR LEADER DEVELOPMENT IN THE ARMY

Phase - II Common is excellent training that prepares candidates with the necessary skills to command a dismounted infantry section. This training reinforces teamwork, self-discipline, and perseverance. Discovering certain personal limits is also part of the learning process. The question remains whether or not this course is truly focused on leadership. That part of the course which focuses on navigation, section attacks and reconnaissance patrols is mostly management-oriented. Management skills are certainly required for any officer, but they seem to be more easily taught than leadership. The actual leadership development, aside from the few lessons, occurs as a by-product of the environment rather than as a structured and purposeful end. Although some aspects of the course, such as the coaching from the sergeants, should not be altered, leadership should take on a more central role. The course's leadership development component could be enhanced by (a) increasing the focus on candidate self-awareness, (b) including classes on self-discipline, and (c) providing instructors with training in coaching and mentoring.

Self-awareness can be a very useful tool with which to develop one's leadership abilities. It could be integrated into the course with minimum disturbance to the original training plan. On the single feedback loop level, the candidate could be more involved in the debriefing process upon completion of a task as well as in the weekly report. Instead of the debrief being a nearly one-sided conversation, the directing staff and the candidate could provide a short analysis of the

candidate's performance as well as the leadership skills that were demonstrated. The candidate's feedback would likely not have an impact on the grade achieved. Simply discussing the differences in the instructor's assessment and the candidate's assessment, however, would increase the candidate's understanding of his/her overall performance.

Achieving double-loop learning could prove to be slightly more difficult. This method would require time set aside, perhaps at the end of the course, in order for the candidates to complete self-evaluations and peer evaluations. The staff would be required to impress upon the candidates the importance of these questionnaires. Questionnaires such as the Leadership Trait Questionnaire and the Path-Goal Leadership Questionnaire may prove to be the most useful at this stage in training.<sup>21</sup> They are both fairly straightforward tools that measure relevant leadership traits and styles. Candidates are only beginning their army training

### ***Perseverance and strength of mind are also invaluable attributes to possess.***

and do not need to be bombarded with too much information at this time. These two questionnaires would likely serve as a suitable introduction to the concept of self-awareness. The only stipulation with respect to the use of the tools would be that the course officer and instructors would have to be able to interpret them with the candidates. Though a more time consuming activity than single-loop feedback, it would likely be worth the effort. An informal meeting for each of the candidates with one of the staff would be sufficient to discuss the interpretation of the results of their questionnaires. A peer evaluation would be quite useful—if done properly—but may not be feasible due to time constraints. A self-evaluation and a debrief with a staff member would likely be sufficient for the candidate to begin examining his/her development as an officer. Perhaps one day, or even half a day, would be satisfactory to meet the time requirements.

Self-discipline is key in order to succeed on this course. Perseverance and strength of mind are also invaluable attributes to possess. It is essential for a leader to demonstrate these qualities—especially in combat. One's attention is likely going to be divided in stressful situations; it is therefore critical that a commander be able to remain focused on the task at hand as well as influence his/her troops to complete it.

Self-discipline should continue to be highlighted throughout training. Perhaps a classroom session on the relevance of self-discipline to one's development as a leader would be helpful. Furthermore, self-discipline should be noted for the purpose of continuous monitoring of one's behaviour to ensure that development is ongoing.<sup>22</sup> This information would certainly fit with the self-awareness education. As discussed earlier, the development of self-discipline is simply an extension of self-awareness. Though self-discipline must be emphasized through the entire duration of the course, its relationship to self-awareness could be explained toward the end of training. Several lessons would be needed to successfully complete this plan. Explanations would be required in order for the candidates to understand the importance of such training.

Using education as a tool for development is perhaps not the responsibility of the Phase II - Common training plan. There should, however, continue to be class discussions on topics such as leadership, bearing in mind that one can only learn a finite amount of leadership-related skills from a lecture. Group discussions are possibly the best format through which to understand leadership in a classroom setting.

Coaching should remain largely untouched, as it is likely the most effective means by which to teach leadership skills. Coaching and mentoring could be added to the training the staff receives prior to the course. As

staff, one should strive to be the best possible model for the candidates. Sharing one's experience and knowledge is a powerful development tool for

Finally, as leadership appears to be a current polemic for the Canadian Forces and, more specifically, the Army, it is crucial that officers have a better

change is most likely to follow. Ensuring that candidates receive the best possible training is essential to the development of the Army's officer corps. Most of the above suggestions are fairly simple and cost-efficient to implement. In most cases, they simply involve a more focused approach rather than the introduction of an entirely different training plan. Though some leadership skills are certainly being taught on Phase II – Common, there is considerable potential to further develop the leadership component of this important course.



## ***Providing leadership training to future officers ... it is the responsibility of everyone involved in training officers.***

a course instructor. Maintaining impartiality becomes the challenge in this approach. Candidates should be cautioned, however, with respect to modeling themselves after a single individual. They should be strongly encouraged to take what is best in each of their instructors as opposed to trying to emulate only one person.

understanding of this critical element of command. Providing leadership training to future officers is not only an important task, it is the responsibility of everyone involved in training officers. Training should thus be examined more closely to ensure that its goal of teaching leadership is actually being attained. Once awareness reigns,

### **ABOUT THE AUTHOR...**

Officer Cadet Reashore is a member of the Royal Military College of Canada graduating class of 2002. She has majored in Business Administration with a minor in Military Psychology. Officer Cadet Reashore will be commissioned as a Logistics Officer and will join 2 Service Battalion in Petawawa upon the completion of her training.

### **ENDNOTES**

1. Canadian Forces Publication: A-PD-131-002-PT-001 *Leadership, Volume 1, The Professional Officer*, 31 July, 1973, article 202, p. 2-1.
2. J.C. Rost, *Leadership for the Twenty-First Century*, Wesport: 1993, p. 141.
3. P.G. Northouse, *Leadership Theory and Practice*, Thousand Oaks, CA: 1997, p. 9.
4. Rost, p. 143.
5. *Ibid*, p. 141.
6. Northouse, p. 2.
7. Rost, p. 46.
8. Northouse, p. 9.
9. Canadian Forces Publication: A-PD-131-002-PT-001 *Leadership, Volume 1, Junior Leaders Manual*, 31 July 1973, para 1.a., p. 4-1.

10. J.P. Bradley, "Distinguishing the Concepts of Command, Leadership and Management." In B Horn and S.J. Harris (Eds.), *Generalship and the Art of the Admiral: Perspectives on Senior Canadian Military Leadership*, St Catharines, ON, 2001, p. 112.
11. J.P. Kotter, "What leaders really do," *Harvard Business Review*, May-June, 1990, p. 26.
12. A.J. DuBrin, *Leadership: Research findings, practice, and skills*, Boston: 1998.
13. There are probably other frameworks that could also be used to examine leadership training in the Army. I selected DuBrin because I found it appealing.
14. P.M. Muchinsky, *Psychology applied to work*, 5th ed., Pacific Grove, CA: 1997, pp. 198-99.
15. A.J. DuBrin, *Leadership: Research findings, practice, and skills*, Boston: 1998, pp. 388-89.
16. *Ibid*, p. 389.
17. *Ibid*, pp. 391-95.
18. *Ibid*, p. 393.
19. J.R. Hackman, G. Oldham, R. Janson & K. Purdy, A new strategy for job enrichment. *California Review, Volume XXVII*, 1975, p. 65.
20. A.J. DuBrin, *Leadership: Research findings, practice, and skills*, Boston: 1998, p. 395.
21. P.G. Northouse, *Leadership theory and practice*, Thousand Oaks, CA: 1997, pp. 105, 28.
22. A.J. DuBrin, *Leadership: Research findings, practice, and skills*, Boston: 1998, p. 390.

# Out with the Old and in with the New

by Sergeant Daniel De Groot

*Leadership is the personal art of influencing the behaviour of soldiers. Command is the formal exercise of authority and direction by a designated commander. The two functions are different...*

*Realizing this, the Canadian Army has adopted a philosophy of command...*

*The philosophy is one of **decentralized command** (emphasis in original). The central idea of decentralized command is that subordinate leaders should normally be allowed considerable latitude in accomplishing the mission. It promotes the maximum use of initiative and the decentralized execution of tasks.<sup>1</sup>*

Oh, if we could practise what we preach. This article may come across as a rant on the author's part; I can find no way around that without watering down my message. The purpose of this article is to express the ongoing struggle in the forces to adopt a new (and, I believe, far superior) leadership philosophy in the face of many strict adherents to the old one. In fact, in my experience, most are familiar with this struggle and refer to these systems quite literally as the "new army" versus the "old army." The terms are even used as adjectives to describe individuals, as in "Oh, don't worry about him, he's *old army*."

So what are the new and old armies? What are their core tenets and maxims? The terms have no bearing on the age of the individuals adhering to

difference result in vastly different styles of leadership.<sup>3</sup> In its harshest and worst form, the old army's lack of trust results in micromanagement.<sup>4</sup> Quite simply, if you as a commander feel your subordinates will fail to properly

## ***The real threat posed by old army leadership is that it is safe and easy.***

execute your instructions, you will need to check on, and attempt to run, everything, thus robbing your subordinates of any need (and eventually any ability) for thought or initiative in the execution of the mission.

So what is the problem? True, there are a large number of leaders in the forces who have had long and generally successful careers by being extremely detail oriented. First—speaking as a primary reservist who can quit at any time with a minimum of fuss—consider the effects of such a leadership style on morale and retention. Imagine yourself as an intelligent and motivated, yet low ranking, soldier. If your commanders continually run every aspect of your military life, are you going to feel that your skills are appreciated? If your commanders feel the need to check on all your activities, how trusted will you feel? Not at all. In fact, you will have low job satisfaction as you will not be challenged or employed to your capabilities. This will force you to either rise in rank to gain some authority to meaningfully contribute to the success of your organization or quit and go elsewhere. Sadly, in this

This leads to the real and more dangerous problem with old army leadership: what happens when we go to war? Canadian military history is rife with examples where initiative and creativity has saved the day. Further-

more, numerous papers<sup>5</sup> have extolled the virtues of German decentralized command (there is even a German term for this: *Auftragstaktik*<sup>6</sup>) as a major contributor to the success of German forces in the Second World War. Other papers<sup>7</sup> stress the necessity of decentralized command for the Revolution in Military Affairs. Despite all this support for the new army, the old army will not go away. It may even be winning out over the new army in the hearts and minds of the Army's leadership despite what our intellectuals say. We should all fear the consequence of this boxed-in, traditional, and unimaginative thinking when and if we go to war:

The degree of conformity pursued in peacetime breeds a self-destructive petrification of thought. And it's deeper than merely preparing for the last war. It's a systematic purging and sweeping aside of non-conformist attitudes that threaten the status-quo.<sup>8</sup>

The real threat posed by old army leadership is that it is safe and easy. It requires little imagination and entails little risk (in peacetime). In an environment where the enemy is always where we expect them and never more than one third of our numbers, it makes a twisted kind of sense to micromanage. Our exercises are scripted and our training is predictable. What need for initiative have we? In fact, when surrounded by old army leadership, being new army becomes a definite disadvantage: by not micro-

## ***... what are the new and old armies?***

them; I know of 21 and 22 year-old master corporals whom I consider to be adherents to the old army. Essentially, the difference between the new and old armies is predicated on the issue of trust: the new army trusts its subordinates, while the old army does not.<sup>2</sup> The spin-off effects of this central

author's experience, the latter scenario is all too common. The systematic result of this style of leadership is that intelligent and enthusiastic soldiers capable of solid initiative quit, while those that enjoy mind numbing, thoughtless routine remain behind to later rise in rank and perpetuate a bad system.



managing, you open the door to errors, and those errors become grounds for criticism by others. A junior leader can easily gain a reputation for being incompetent by allowing his subordinates to make mistakes—thus halting his own career progression. This leads to a kind of downward spiral in which old army leaders succeed in peacetime over new army types by virtue of systematic discrimination of the new. As O’Leary notes, “Commanders cannot allow their subordinates out of the box because their own superiors then see them as being out of the box.”<sup>9</sup> I offer no solution to this problem, but if the problem were to be widely recognized or—more importantly—recognized at a very high level, it might be defeated. This is sadly unlikely, for as Gabriel says (quoted in Neill),

the officer who succeeds within the military bureaucracy is more often not a trained combat leader ... but more likely an experienced bureaucratic infighter who ... knows how to survive in a bureaucratic system that rewards *non-inventiveness, compliance, a willingness to follow rules without question* ... [emphasis added].<sup>10</sup>

The consequences of this type of stifling “leadership” at the infantry section and platoon level are obvious to those looking for them. One sees soldiers forced to arrange their kit according to narrow and rigid standards. A poignant example is the arrangement of the magazine pouches. The standard calls for one pouch on the left, one on the right. I for one am left handed and prefer both pouches on the left. Others, no doubt, would prefer both on the right. This perhaps seems like a trivial matter until you find yourself changing magazines during battle where those extra few seconds trying to close a pouch with your weaker hand can get you killed—all in the name of standardization. Moving up, we see section commanders compelled to perform all tactics and drills according to a similarly rigid set of drills or inspections conducted according to some standard, where soldiers are told “do it this way for inspection, but in the field, do whatever you like best,” thus defeating the whole point of having an inspection.

The new army style requires all levels of the chain of command to be on board; as soon as one old army leader is

introduced, s/he ruins it for everyone below. It is the very nature of new army leadership that one cannot force subordinate commanders to adopt that leadership style as their own. To attempt to do so would be antithetical to the very nature of decentralized command.

*Trust and respect are critical to decentralized command. They promote cohesion. They are enhanced by the retention of individuals for long tours with the same section or platoon, and by the establishment of common techniques, procedures, drills and tactics.*

*The process of selection and training of leaders must focus on the character qualities of determination and initiative. There is no place in the infantry platoon for unthinking commanders who lack the ability or desire to pursue the highest standards in the execution of their tasks.*<sup>11</sup>



## ABOUT THE AUTHOR...

Sergeant Daniel De Groot serves with a Primary Reserve infantry regiment (The Lorne Scots). He joined the forces in 1994 and became a Sergeant in 2000. He has an Honours Bachelor of Science from the University of Toronto, where he specialized in Software Engineering with a minor in Political Science. He works as a programmer for a large Canadian communications company in Toronto.

## ENDNOTES

1. B-GL-309-003/FT-001 *The Infantry Section and Platoon in Battle*, 1996, p. 3-1-1
2. My best guess as to why this is so, is that it comes from times when large numbers of often unwilling conscripts made up a significant portion of our forces.
3. In fact, I will admit my bias towards the new army philosophy is strong enough that I do not consider the old army to be a style of

leadership at all but rather a system of command as alluded to in the introductory quotation.

4. I think this term was invented by the Army—I have never heard it outside of military context—it is aptly descriptive nonetheless.

5. Chuck Olivero, “Auftragstaktik and Disorder in Battle: Learning to see the Battlefield Differently,” *The Army Doctrine and Training Bulletin*, Vol. 4, No. 2, pp. 57-59; Chuck Olivero, “Trust, Manoeuvre Warfare, Mission Command and Canada’s Army,” *The Army Doctrine and Training Bulletin*, Vol. 1 No. 1 (1998), pp. 24-28; Dr Scott Robertson, “Experimentation and Innovation in the Canadian Forces,” *Canadian Military Journal*, Vol. 1, No. 2 (2000), pp. 65-71.

6. Both of Lieutenant-Colonel Olivero’s papers cited in note 4 discuss this in depth.

7. Dr. Elinor Sloan, “Canada and the Revolution in Military Affairs: Current Response and Future Opportunities,” *Canadian Military Journal*, Vol. 1, No. 3, 2000, pp. 7-14; LCol Wayne Pickering, “Revolutions in Military Affairs: Fact or fiction? Part II,” *The Army Doctrine and Training Bulletin*, Vol. 2, No. 4, 1999, pp. 23-31.

8. Mike O’Leary, “Tigers Can’t Live in a Box,” *The Army Doctrine and Training Bulletin*, Vol. 1, No. 1, 1998, p. 58.

9. *Ibid.*, p. 57.

10. Donald A. Neill, “Ethics and the Military Corporation,” *Canadian Military Journal*, Vol. 1, No. 1, 2000, p. 36.

11. B-GL-309-003/FT-001, *The Infantry Section and Platoon in Battle*, 1996, p. 3-1-13.



# To Fix and Strike

## The LAV III in Mobile Defence

by Second Lieutenant David Hill

**T**he light armoured vehicle (LAV) III armoured personnel carrier (APC) has introduced a whole gamut of new possibilities for the employment of mechanized infantry in all phases of war. This is due to the numerous technological improvements introduced by the LAV III and their application to Canada's manoeuvre warfare doctrine. History has shown that technological improvements necessitate doctrinal adjustments. The machine-gun in WWI, armoured vehicles and fighter aircraft in WWII, night vision goggles and helicopters in Vietnam, and precision-guided munitions in Iraq all pay homage to this fact. The advent of the LAV III to Canada's arsenal also requires an examination of its possible applications to the battlefield. This paper argues that mobile defence is a key opportunity to exploit the technological advantages of the LAV III APC.

In order to successfully illustrate the benefits of the LAV III in mobile defence, the proper groundwork must be set. Firstly, a review of Canada's doctrine on manoeuvre warfare and defensive fundamentals will be examined. Secondly, the technical improvements that the LAV III has in comparison to Canada's previous APCs must be clarified. These two topics of doctrine and technology will then be merged with a view to synergistically maximizing the combined utility of LAV III technology with the tactics that the Canadian Army employs with regard to mobile defence.<sup>1</sup>

First, it is critical to review the key precepts of Canada's manoeuvre warfare doctrine and defensive fundamentals. This review is important in order to accurately attempt to analytically intermingle the key tactical

considerations with the technological improvements. Manoeuvre warfare contends that there are three milestones to define success: physical destruction, defeating the enemy's will to resist, and breaking enemy unit cohesion. Successful physical destruction is a function of fixing and striking the

### ***The LAV III ... has introduced a whole gamut of new possibilities for the employment of mechanized infantry...***

enemy by integrating the six elements of combat power: command, information operations, manoeuvre, firepower, protection and sustainment. This integration focuses on the main effort, the synchronization of resources, and maintaining a superior tempo to that of the enemy.

Physical destruction, however, is only one of three parts to success in combat. Pre-empting, dislocating and disrupting the enemy attack his cohesion and will to fight. Pre-empting refers to seizing an opportunity before the enemy. Dislocation is the denial of the enemy to exploit his advantages, and disruption ruptures enemy integrity by confusing, delaying and surprising. This summary of manoeuvre warfare theory illustrates the key issues only; the important concept to take away from this is the differentiation from attrition warfare, which focuses on force-on-force encounters, the holding of ground and static defences. Clearly this focus contrasts the manoeuvrist approach, which favours seizing initiative, attacking weaknesses and moving aggressively.

To sharpen the focus of this analysis of Canadian doctrine, there are many principles and fundamentals that

apply specifically to defensive phases of war. The three principles of war that apply to the defence are: concentration of force, offensive action and security. Without delving into the definitions of these terms, it is clear that the concept of mobility aligns with these principles. Additionally, there are eight fundamentals of the defence that must be considered and applied by all commanders: information gathering, use of terrain, coordination, mutual support, depth, manoeuvre, firepower and use of reserves. These fundamentals and principles form the cornerstone of this analysis. Using this foundation, the technological advantages that the LAV III offers to mobile defence can be constructed.

The *Land Force Tactical Doctrine* states that:

The mobile defence focuses on the destruction of the attacking force by permitting it to advance to a position which exposes it to counter-attack and envelopment. The emphasis is on defeating the enemy rather than retaining or retaking ground. Mobile defences employ a combination of offensive, defensive and delaying action necessitating the forward deployment of relatively small forces and the use of manoeuvre supported by fire and obstacles to wrest the initiative from the attacker after he has entered the defended area.

It is with this theme of manoeuvre warfare that the analytical integration of the LAV III and mobile defence will now be examined.

There are five key areas in which the LAV III exhibits technological improvements over Canada's past

abilities. Specifically, these include: weapon systems, optics, tactical navigation (TACNAV), protection systems and communications. Arguably, the advanced weapon system of the

### ***The LAV III should never be completely motionless when under engagements...***

LAV III is the key component of tactical significance. The main weapon system is the 25-mm canon on a stabilized platform, which is accurate up to 2200 m against enemy LAVs (BMP, BMD, BTR, BRDM, MT-LB, and other vehicles of this genre). Additionally, there is a coaxial 7.62-mm machine-gun, accurate to 1400 m against infantry, a pintle mount for either a C6 (1400 m) or a C9 (600 m), and multi-barrelled grenade dischargers for smoke screening. The key deduction from this information is the opportunity for long and effective stand-off ranges and accurate engagements while mobile. From this data, a solid deduction is that the most significant element that the LAV III introduces to mobile defence is improved weapon systems.

The 25-mm Bushmaster canon, as described earlier, has created a positive stand-off range from 900 – 2200 m. This stand-off range allows for an early engagement with the enemy that would delay their advance and obstruct their estimation of the defensive centre of mass. To clarify this point, an example will be used. If a Genforce motor rifle regiment (MRR) is advancing, the first elements that will establish a contact will be the regimental recce, then the forward security element / combat recce patrol (CRP) of the lead battalion. They will define the defensive positions, either by an initial visual contact or from a weapon signature, as they are engaged. Regardless of the method, they will inform their higher commanders of the grids of the elements that have been detected, and their commanders can determine how to proceed.

If the LAV III is employed forward of the dismounted troops, as a covering force, then the enemy can be disrupted

and deceived by striking, then manoeuvring the vehicle back to the next battle position once the enemy has committed to an action. The advantages to this strategy are many. The enemy is pre-empted because the initial contacts should be well orchestrated and rehearsed such that they maximize the stand-off range of the main canon.

If the enemy regimental artillery group (RAG) is employed, then there will be less damage due to the spacing of units as opposed to an area defence. This is because the majority of the troops are not mounted and are located at least a half tactical bound behind the LAVs. The vehicles should also be well dispersed so that one effective indirect volley does not destroy more than one vehicle. Hit and run tactics can be employed here. The vehicles can establish a clean-break area after the initial direct fire battle and before indirect fire can be accurately bracketed. If the enemy commander attempts to manoeuvre enemy forces using a flanking or frontal assault, then the enemy is being effectively shaped by mobile defence. The initial LAVs will manoeuvre back to the next position before committing to a decisive engagement. This shaping action should be the focal point for the commander since the striking power of mobile defence climaxes with the assault of the counter-move force into the main killing zone (KZ).

It is also important to specify the advantage that the stabilized canon imparts to this scenario. The LAV III

positions, spanning up to 300 m in total. This allows not only for dispersion against artillery but also for surprise when engaging with the 25-mm canon. The LAV should move first to a turret-down position, allowing the commander to eye the target; then the vehicle should move forward to a hull-down position and fire when just above the crest; then the LAV should back off, exposing itself for the absolute minimum time (5-15 seconds). Without stabilization (stab), a vehicle would have to stop and then acquire a target. Stab allows this manoeuvre to happen while the cresting movement is occurring, which minimizes the exposed time in the vulnerable hull-down position.

This stand-off range should incorporate a reverse slope and force multipliers, such as water features and defiles, to exploit all of the tactical advantages of the ground. When the forward LAVs are ordered to withdraw to their second battle position, they have two options: they can move back to another covering force location and remain ahead of the dismounts, or they could move back through the dismounts to allow the limit of the 25-mm canon's stand-off range to match the limit of the Eryx.<sup>2</sup> This move will allow for a concentration of force in the kill zone while maintaining dispersion. The focus of siting the LAVs in this manner emphasizes the weapon system as opposed to the troop-carrying ability of the LAV. This aspect can also be incorporated, but only as a second priority. The ability to use all of the natural force multipliers is maximized

### ***The focus of siting the LAVs ... emphasizes the weapon system as opposed to the troop-carrying ability...***

should never be completely motionless when under engagements with enemy LAVs. This is true for the cresting drills, for the withdrawal action that will follow the initial direct fire battle, or for the advance of the counter-move force. When the firing lines are sited, it should be considered that for each vehicle there should be at least three to four staked-in turret and hull-down

only when a manoeuvristic approach is taken, since an area defence would only be tied to the local terrain features.

The second area of dramatic improvement for the LAV III is in the area of optics. The main sight for the weapon systems is the thermal imager (TI). It is capable of detecting stationary, exposed targets at 3000 m;



**We must exploit the capabilities of the LAV III to the fullest. (Courtesy CTC)**

stationary, cold, hull-down, and camouflaged targets at 2000 m; and moving targets at 3500 m. Secondary to this is the day sight, which compares closely to the TI in each of the previous examples with the obvious exception of night-time. For night operations, there is a crew commander's image intensification (II) sight; however, the TI still remains the primary sight at night. The II site is effective to approximately 1200 m under the ideal conditions of clear skies with an abundance of ambient light. At this range, it is much easier to detect a cresting object than objects moving on forward slopes or in low ground, although the latter is possible to detect. With cloud cover, it is difficult to see more than 500 m. In this case, however, the commander can use artificial means to improve the ambient light conditions, either by using indirect illumination, glow stick markers, trip flares, or any of many cunning illumination plans. However, it must be considered that these tactics may also increase the enemy's optics disproportionately in the enemy's favour.

The TI sight allows for the detection of targets at ranges that match and surpass that of the weapon systems. This is only true, however, when the weather is ideal. Mist and precipitation can eliminate any visibility with the sight, and cold temperatures can cool a vehicle hull enough to mask it from detection.

This deception can be amplified if there is foliage or cam-netting obscuring the image. It is important to note, however, that the enemies' TI will be equally disadvantaged in these conditions and that moving vehicles will always have a heat signature and be relatively easy to spot. Since the focus of this document is on defence, clearly the optical advantage will rest with the defender who has the ability to utilize these advantages and incorporate them into an intelligence, surveillance, target acquisition and reconnaissance (ISTAR) plan to effectively anticipate enemy approaches and routes.

Fundamental to the information gathering aspect of a defence is the ISTAR plan. ISTAR interlinks all of the commander's means of detection over the given area so that fire control, movement and battle plans can be efficiently developed and coordinated. This includes all of the optical devices of the LAV III such as the TI, day site, II site, binos, NVGs, and any other unit resources, such as the NODLR (Night Observation Device, Long Range), OPs/LPs (observation posts / listening posts), etc. This information is described on an overlay so that the final product can be applied on a map that portrays all of the ISTAR information available for the given area. The optical and ISTAR advantages that the LAV III exhibits in mobile defence improve security, mutual support, and allows the commander more resources from

which to base decisions and fight the defensive battle. Mobile defence should incorporate route reconnaissance, pickets, OPs/LPs, and security elements into the ISTAR plan to maximize the available resources and increase the overall awareness of the commander.

It must also be noted that the optical improvements of the LAV III are not limited to the sights. The driver's viewing aid (DVA) and the crew situational awareness monitor (CSAM) also give advantages that were not available before. The DVA allows the driver to see on a screen what is in front of him so that he can drive with much more tactical awareness and in safer areas. This advantage allows the crew commander the opportunity to focus more time and energy on enemy detection and tactics as opposed to simply guiding the driver. The CSAM allows the crew commander to designate targets to the troops in the back of the carrier who would otherwise have no understanding of the terrain, battle, or enemy disposition. Both the DVA and the CSAM have positive applications to mobile defence. Also, these two benefits have a carry-over significance for night-time operations, and this theme will be expanded upon when analyzing the benefits of TACNAV.

The third area of improvement includes all of the elements in the TACNAV system. There are three key capabilities that the TACNAV system fosters. First, there is the GPS that displays the current position and any inputted routes on a screen available to the crew commander, driver, and the troops in the back. The second capability is dead-reckoning, which simply indicates the compass bearing of the turret. Third, the TACNAV system, used in concert with the laser range-finder, allows the crew commander to laze targets and receive accurate grid references instantaneously. This capability allows for a significant simplification of cross-country navigation as well as greatly improved grid references for contact reports.

In mobile defence, tactical manoeuvre is implicit. The TACNAV system allows for the preregistration of precise grid points in such a manner that the

withdrawing or counter-move force will be able to manoeuvre as simply and accurately as possible. Since the crew commander, driver and troops in the rear all have a navigation screen, there is a broader situational awareness than before. This advantage in movement is especially true at night when manoeuvre is more difficult, yet the yielded surprise can be greater. Obviously there is a scope for the commander to aid this movement with luminescent pickets, glowsticks, panel markers and rehearsals; however, the fact that the TACNAV system allows for such accurate cross-country navigation is a significant improvement from Canada's previous APCs.

The second benefit that the TACNAV system offers to mobile defence is exact grid detection via the integrated use of the laser range-finder. This allows for a precise grid reference from lasing the area in question. The benefits of this are obvious: people make errors in judgement, lasers do not. Having said this, the system must nevertheless be properly calibrated to give exact grid data. This data allows the commander to obtain exact preregistered KZ information by day and night with a greater certainty of accuracy. This advantage would also be apparent during a chance contact when forces are either withdrawing to their next position or advancing as the mobile reserve. All that would be required is an accurate lay and laze.

Third, it is fundamental to point out that the key to a mobile defence is aggressive manoeuvrability. The TACNAV system offers this exact requirement. The physical ability of the LAV III to move is limited since it is not a tracked vehicle, yet it can go in most areas that other AFVs (armoured fighting vehicles) can go. The manoeuvrability offered by the vehicle and the TACNAV is also complementary with the stab system mentioned earlier. Clearly, TACNAV provides advantages in employing this vehicle as part of a mobile defence.

Fourth, the LAV III APC significantly increases the level of protection for the crew and the troops within it due to five key improvements. The physical armour

on the hull and turret, the AN/VDR-2 radiac metre, the ventilated respirator system (VRS), the laser warning receiver (LWR), and the automatic fire and explosion suppression system (AFESS) all significantly improve the protection for personnel in the LAV compared with Canada's previous APCs. Obviously, there is the physical protection of the external armour, which withstands small-arms fire at close range on all sides, .5 calibre rounds completely from the front, and mid-to-long ranges broadside. The armour can also withstand 30-mm frontal shots at ranges greater than 900 m. In addition to this physical protection, the LAV includes the AN/VDR-2 radiac metre that measures high and low level penetrations of radiation. This technology allows the crew commander to detect, report and avoid contaminated areas. The LAV also has the VRS that recycles usable air in NBC (nuclear, biological, and

### ***The protective advantages ... allow the commander to fight this vehicle much more aggressively...***

chemical) conditions and filters it through to each member within the vehicle. Physically, the LAV has an attenuation factor of 3.7, which is an improvement of 0.1 from the M113. Both the radiac metre and the VRS assist the LAV significantly in NBC conditions. The LAV has an LWR that detects the direction of both laser range-finders and target designators. From this alarm system, the crew commander can detect an enemy lazing the vehicle and react appropriately. If a LAV should suffer a direct-fire hit, the AFESS will detect the explosion and discharge the HFC-125 suppressant to counter the destruction. To reiterate, however, the best defence is a good offence; the 25-mm cannon is as much a protective element to the LAV and its crew as the protective devices installed in it.

The protective advantages of the LAV III in mobile defence allow the commander to do battle with this vehicle

much more aggressively than with other APCs. The use of a zulu hide would be a considerable waste of firepower. The crews are not as vulnerable to indirect fire and small arms in the LAV III. One can reference the minestrike that occurred in Eritrea with 2 RCR in 2001 as validation for the protective armour on the LAV III. In this instance, the hull maintained its integrity and the crew members were uninjured, even though the mine that was detonated was designed to destroy a tank. In addition to the protective elements that are technically incorporated into the system, the use of terrain, dispersed fire positions and mutually supporting battle positions are key elements to maximizing protection while conducting mobile defence. This dispersal can clearly be achieved through mobility.

Likely the second most significant protective advantage that the LAV III offers to a mobile defence is the LWR.

When cresting and engaging, the LWR warns the crew commander to withdraw from the crest, slew his turret, and engage once detected. This ability is also advantageous when the initial LAVs withdraw to their second battle position, or when the counter-move forces advance and strike. The LWR allows the crew to move, detect and retaliate against laser range-finders and target designators. Clearly a dug-in vehicle would not have the flexibility to deal with such a situation as fluidly as a mobile one.

The internal protective systems, such as AFESS and the respiration systems, aid in mobile fighting during NBC conditions. This gear increases the survivability of the troops when moving in contaminated areas or during chemical and biological attacks. Both the AN/VDR-2 detection system and the VRS afford better conditions for troops required to fight and exploit NBC conditions. This advantage gives the commander an ability to move vehicles in areas that previous APCs could not have negotiated.

Finally, it is important to note the improvement that the TCCCS (Tactical Command, Control and Communications System) digital radio system has on the LAV III. TCCCS allows for relatively

long-range transmission in secure and frequency hopping modes using encrypted means. This ability significantly improves our defence since the enemy's electronic warfare abilities are disrupted. The benefits of this new communication system to mobile defence are significant. TCCCS allows for longer range transmission along more secure means. In mobile defence, there will be an increased requirement for radio codewords, orders and reports when compared to a static area defence due to the increased dispersion and manoeuvre. The better the communication, the better the command and control of the defence, and, ultimately, the more successful the mission.

This concludes the theoretical merger of the LAV III technologies to the doctrine of mobile defence. It is a merger that is based on the manoeuvrist approach, the principles of war and the fundamentals of defence. Separating the LAVs from the troops and forming them into covering and counter-move forces allows the

commanders to maximize the use of natural force multipliers in order to pre-empt, dislocate and disrupt the enemy. This will damage the enemy's cohesion and will to fight.

The separation of troops from the vehicle is only feasible because of the improved technology that the LAV offers to the Canadian mechanized arsenal. The advanced weapon systems, the optics, TACNAV, the protective systems and the communications of the LAV are far more advanced than any infantry fighting-vehicle that Canada has owned. Because of this, a new emphasis must be made that exploits the advantages of this new technology. An especially key area is that of mobile defence. The LAV, as a counter-move force, is an ideal use of reserves. Firepower and concentration of force are both obtained via the concerted and well-orchestrated use of fire control orders and the 25-mm chain gun. Depth is obtained by separating the dismounted troops from the vehicles and withdrawing before a decisive

engagement is undertaken. Mutual support is inherent to a well-sited firing line and troop positions. Coordination of resources via an ISTAR plan, effective use of the TCCCs, and, most importantly, efficient battle procedure will improve the commander's overall security, situational awareness and command and control. The two final fundamentals and principles that relate to the defence are offensive action and manoeuvre. Clearly, a mobile defence that focuses on shaping the enemy into a main killing zone for the cavalry to fix and strike will inherently exploit these two key fundamentals. It is due to the compatibility of these manoeuvrist and defensive doctrines to the LAV III APC that the argument for mobile defence is both legitimized and strengthened.



#### ABOUT THE AUTHOR...

Second Lieutenant David Hill graduated from The Royal Military College of Canada in May 2001 with a First Class Honours degree in Politics and Economics. He completed Phase 4 Infantry during the summer of 2001, on the first serial to complete training with the LAV III. He is currently a platoon commander in the 2nd Battalion, The Royal Canadian Regiment. 2Lt Hill also participated as a platoon commander on the LAV MAIS trial from September to November 2001.

#### BIBLIOGRAPHY

- Canada. Department of National Defence. C-30-600-A00/MB-001, *Operating Instructions Light Armoured Vehicle (LAV) 8x8*.
- Canada. Department of National Defence. B-GL-300-000/FP-000, *Canada's Army, We Stand On Guard For Thee*.
- Canada. Department of National Defence. B-GL-300-002/FP-000, *Land Force Tactical Doctrine*, Vol. 2.

Canada. Department of National Defence. B-GL-300-001/FP-000, *Conduct of Land Operations – Operational Level Doctrine For The Canadian Army*, Vol. 1.

*Tactics, Techniques and Procedures at the Combat Team Level* (Tactics School TAM / TTPs 2001).

LAV Crew Commander MLP's (LAV cell of the Infantry School 2001).

#### ENDNOTES

1. It is important to note here that this paper makes reference to company-sized units and larger. It is implicit that other combat arms will be integrated into this concept of mobility, especially tanks. The specific integration of the LAV III with artillery, tanks, and engineers is outside of the scope of this paper, although it must be considered that they will play a significant role. For example, tanks and LAVs will co-operate on firing lines, but the placement and dynamics of this co-operation are questions to be raised in a separate debate.
2. Note that if the LAV III were modified with a medium-range (2000 m) anti-armour weapon such as the Javelin, then the platoon and company would not be limited to the Eryx (600 m) in their AA capabilities, which overcomes a significant defensive hurdle.

# The Cult of Technology Laid Bare

by Major John Malevich, CD

*The unrelenting progress of mankind causes continual change in the weapons; and with that must come a continual change in the manner of fighting.*

—Mahan 1890

Since the Gulf War, there has been a great deal of attention lavished on the technology that was used by the Coalition to defeat Saddam Hussain. This was, of course, the first war after the end of the Cold War. It pitted an American-led coalition of Western armies, which had spent decades preparing for war with the Soviet Union, against a regional power armed with the best Warsaw Pact technology that money could buy. The result was what could only be described as a stunning victory by the Coalition. Because there were so few casualties, many attributed the victory of the Coalition to technology, and because so much strike and post-strike footage was broadcast on TV, technology was the aspect that stuck most profoundly in the minds of the public. Precision-guided munitions (PGM), attack helicopters, stealth bombers and satellite communications indicated to many that we had entered a new age of warfare that was principally driven by technology.

The then Secretary of Defence Cheney concluded in the official after-action report that "the War demonstrated dramatically the new possibilities of what has been called 'the military-technological revolution in warfare.'" <sup>1</sup> This term was later changed as many had thought that the conduct

especially in the American military, has inspired a plethora of articles, books and debate. With the US military fulfilling the role of *Primus inter pares* in NATO and other coalitions, debate on the RMA and its future direction will have an increasing impact on other Western armies, especially if they hope to continue to be interoperable with the US. However, the unbridled enthusiasm for the strictly technical

aspects of an RMA, without considering its historical context and the timeless nature of war, may lead us to make technology a panacea for war rather than the handmaiden of the warrior.

War is a balance between technology and doctrine. The supremacy of technology, in and of itself, cannot make up for poor doctrine. Where we are now, with regard to military power, is not the product of some sort of RMA, but, rather, is the result of evolutionary changes in technology and doctrine since 1914.

This paper will explore the relationship between technology and doctrine leading up to what has been called the RMA. Through historical examination, I will demonstrate that there are shortcomings in defining an RMA solely in terms of technological advances without taking into account the unchanging nature of war or the

of an RMA and how they have been defined. This will be followed by an examination of the relationship between doctrine, technology and war from 1860 to the Gulf War.

The concept of RMA first entered the lexicon of military studies when Michael Roberts delivered his inaugural lecture entitled "*The Military Revolution 1560 - 1660*" at Queen's

## ***... the debate on the nature of RMA and how it interacts with the nature of warfare is in constant flux.***

University in Belfast in 1955.<sup>2</sup> Roberts demonstrated that between 1560 and 1660, changes in the areas of tactics, strategy, size of armies, and socio-political institutions amounted to a "Military Revolution."<sup>3</sup> This, of course, led to debate in intellectual circles, but it had yet to gain any attention within the military. Among historians, there seems to have been little agreement on the concept of RMA in either their natures or effects. In 1988, Clifford Robins entered the debate by saying that "the military was characterised by long static periods interspersed with short periods of intense change."<sup>4</sup> In 1994, Kreprinovich advocated that the military had undergone no fewer than ten RMAs. He said: "RMA's occur over a short period of time, when the applications of new systems combines [sic] with innovative operational concepts and organizations in a way that fundamentally alters the characteristics of warfare."<sup>5</sup> This issue is far from clear; the debate on the nature of RMA and how it interacts with the nature of warfare is in constant flux.

### TOFFLERIAN WAVES

Even a very tertiary study of RMA or US Army doctrine will indicate that perhaps the most influential writers on the RMA are the "Futurists" Alvin and

## ***... the timeless nature of war may lead us to make technology a panacea for war rather than the handmaiden of the warrior.***

of warfare had undergone nothing short of a revolution in military affairs (RMA). Enthusiasm for this concept,

conceptual changes that are also necessary to ensure success in war. This paper will begin with a brief description

Heidi Toffler. In their book *War and Anti War: Survival at the Dawn of the 21st Century*, the Tofflers introduce their analysis of war throughout history and give their vision of how they perceive war will be conducted in the future. The Tofflers define the RMA as follows:

*A military revolution, in the fullest sense, occurs only when a new civilisation arises to challenge the old, when an entire society transforms itself, forcing its armed services to change at every level simultaneously—from technology and culture to organisation, tactics, training, doctrine, and logistics. When this happens, the relationship of the military to the economy and society is transformed, and the balance of power on earth is shattered.<sup>6</sup>*

The Tofflerian view of war is based on how cultures create wealth. In accordance with that, they have divided war into three waves: first wave (agricultural), second wave (industrial), and third wave (knowledge).

#### First Wave War (Agricultural)

This form of war is attributed to societies where the main economic activity is agriculture. War must be timed to coincide with the collection of the harvest, and, as a result, they engage in primarily seasonal fighting. They are poorly organized and equipped. Orders are verbal and pay is irregular. The nature of killing is face to face. They categorize first wave warriors as being from Classical Greek and Egyptian armies, ancient China and feudal Europe. However, first wave societies do not stop with the commencement of the modern or industrial age. Even today, we find first wave cultures in places like Africa, Bosnia and South-East Asia.

#### Second Wave War (Industrial)

This type of war is typified by states that have gone through the industrial revolution. It is characterized by highly organized armies, armed with standardized mass-produced weapons. Attrition warfare is the most predominant form of warfare, and the nation with the greatest capacity to produce weapons and material is the

nation that will prevail in the long run. Second wave warfare spans from the beginning of the industrial revolution to the present. It reached its apex with the production of the atomic bomb. It could best be illustrated by the Second World War, where the industrial potential of the US was fully realized by the mobilization of millions of soldiers and the awesome mass production of the tools of war. Killing, in itself, had become a process of mass production, as demonstrated by the factorylike killing of six million Jews by the Nazis or the mass air raids on German and Japanese cities, which killed thousands in a matter of minutes.

#### Third Wave (Knowledge)

This is the aspect most focused upon in the Tofflers' theory. Knowledge warfare is information driven; it is typified by the Gulf War. The focus here is on precision-guided munitions (PGM), robots, nonlethal technology, satellite communications, directed energy weapons and cyber warfare. For the Tofflers, the emergence and growing importance of technology have led to a decentralization of capability and the emergence of niche capabilities. The Tofflers believe that third wave warriors will be able to use their superior technology to vanquish the enemy. Advanced reconnaissance and communications satellites will allow the information warrior to know where the enemy is; what the enemy is doing—in essence, remove what von Clausewitz termed the "fog" or "friction" of war; and, through the use of more advanced technology, the third wave warrior will be able to strike anywhere with impunity before the enemy has had time to react.

As influential as the Tofflers have been, their version of war and the RMA is flawed. They view war as an extension of how wealth is generated in a society.<sup>7</sup> This is the cornerstone of their argument; however, its focus on the generation of wealth and technology fails to adequately address the true nature of war. In fact, some are now arguing that the Tofflers' theory has no basis in historical reality.<sup>8</sup> For the Tofflers, conflict between societies of different waves was inevitable, and, the more technologically advanced the

society, the more assured it is of victory over second or third wave societies.<sup>9</sup> However, the Tofflers do not explain why agrarian societies can and do triumph over more technically advanced societies (like the Afghans over the British in one century and the Russians in a second century, or the Vietnamese over the US).

The Tofflers and many other pundits place technology at the forefront of success in war. This is a typically Western response to war. We have constantly been in search of a silver bullet that will vanquish all foes. The search for this panacea has proven illusive; although technology has at times appeared to give the answer, success has often only been fleeting. Humankind's ability to adapt and change in an effort to survive has nullified what seemed to be decisive advantages afforded by technology.

When examining war and the RMA, there have traditionally been two views: the scientific, as characterised by the Tofflers, and the historic. For those who view technology to be the dominant factor in warfare, war is a predictable process: victory is based on simple calculations of cost-benefit analysis. The technologist believes that if enough force is applied and if enough targets are destroyed, then victory is assured. To the historic view, the effects of technology are little more than an enabler in an uncertain enterprise in which chance, friction, and the limitations of the human condition decide conflicts. In the unscientific view of war, for defeat to have meaning, it must be inflicted in the minds of the defeated and it should deliver an unambiguous verdict.

Throughout military history, the relationship between technology and doctrine has been an essential, but extremely complex, part of achieving a successful military revolution. The problem is to keep these elements in balance through periods of great change.<sup>10</sup> Of course, this is all the stuff of staff college debates, which begin to take on the form of the chicken and the egg (i.e., does doctrine shape technology, or do advances in technology shape doctrine?). The failure to change





**Strength in Numbers?** The PzKpfw II with its 20 mm cannon and thin armour made up a sizable portion of the German force that invaded France in 1940. It was vastly inferior to the French Char B1 Bis and Somau, which were armed with 75 mm and 47 mm guns, had thicker armour and were more numerous than German tanks.

doctrine in the face of technological advances has resulted in some of the worst military failures and slaughters in history. Conversely, the detailed study of military history, which has inspired changes in doctrine, in the absence of technological advancement has led to some of the most spectacular victories in military history.

#### THE FAILURE OF DOCTRINE IN THE CIVIL WAR

The US Civil War was clearly a case where the failure to change doctrine in the face of monumental technological change led to slaughter and defeat. The Civil War has been described as the last of the old wars and first of the modern wars.<sup>11</sup> This war saw the introduction of a workable rifled musket, breach loading repeating rifles, the employment of massive entrenchments, the strategic use of railways to move troops, and the use of the telegraph to stay in contact with units in the field. By the beginning of the Civil War, both sides would be armed with the rifled musket, which utilized the percussion cap. The rifle was not new to the battlefield; however, earlier models had been hampered by a reduced rate of fire due to fouling after firing and were not considered practical on the battlefield. Evolutionary improvements to the musket, such as improved techniques of mass production, metallurgy, and the introduction of the conoidal bullet constituted a marked improvement in the rifle, making its use practical on the battlefield. The rifle

would make the individual soldier more deadly than ever, and it would have the greatest impact of any weapon on the battlefield up to WWI.

The rifle represented a vast improvement over the smoothbore musket. Not only was the rifle more accurate, but it extended the range of the soldier from 400 paces, above which the smoothbore was completely useless, to 800 yards, where the rifle could engage troop formations; at 1000 yards, it retained enough terminal velocity to penetrate four inches of pine.<sup>12</sup> The rifle placed in the hands of each soldier a weapon that could match the range of the artillery, banishing it to the periphery of the battlefield forever and reducing its effectiveness until wireless and mapping technology could make artillery the great killer of the battlefield once again. In fact, the Civil War was the first war in which wounds inflicted by the infantry would outstrip those caused by artillery.<sup>13</sup> Although there had been vast improvements in the deadliness of the firepower that the soldier could wield, the belligerents began the war using Napoleonic tactics. These consisted of linear formations where both sides stood in close ranks and fired volley fire until one side launched a charge to bring the battle to an end. The effect of the improved accuracy of the rifle coupled with obsolete Napoleonic linear tactics was devastating.

Without the sanction of doctrine, both sides were forced to turn to dispersion in order to survive. First the

belligerents sought cover behind trees or in low ground. Later they would turn to the creation of elaborate fortifications and trench warfare, as at Vicksburg, Petersburg, and Knoxville.<sup>14</sup> These field fortifications would bear startling resemblance to the trenches that came to characterize the First World War. The increased effectiveness of the rifle led to dispersed formations on the battlefield and increased difficulties of command and control, as the individual soldier now had the opportunity to decide if he would fight or not. This, of course, was not sanctioned doctrine, but it became common practice within experienced units. As new units were formed and became operational, they would learn that Napoleonic formations were no longer suitable to this new way of war. Unfortunately, this was a lesson that did not have to be learned the hard way.

Perhaps more significantly, the Civil War would serve as an example of the destruction that could be wrought when an earlier RMA, which was introduced by the French in 1789, was put into practice by the Americans, namely the *levée en masse*. After the French Revolution, there occurred an RMA that changed the face of warfare and had far reaching implications to this day.<sup>15</sup> The French Revolution established the norm that all citizens, their goods, and all national resources would be mobilized under the banner of nationalism. This resulted in a massive increase in the size of the French Army and the resources that the

French were able to mobilize. Napoleon would not be defeated until his enemies matched him in size. While the wars of Napoleon had been fought when the industrial revolution was in its infancy, by the time the Civil War was fought, the industrial revolution was quite mature. This meant that the belligerents, especially the Union, were able to mobilize, arm and wage war on a level never before seen in the field of human conflict.

The cumulative effects of the destructiveness of the rifle and mass mobilization, coupled with the failure of the belligerents to change doctrine in order to adapt to the changes brought about by improvements in technology resulted in the most costly war in American history. Before the end of the war, 200 000 soldiers from both sides would die of wounds, while another 400 000 would die from disease.<sup>16</sup> The failure to recognize changes in technology and to adapt accordingly would again be played out by others on even a grander scale 50 years later.

#### THE GATHERING STORM

At the end of the Civil War, advances in technology continued to evolve. Improvements to firearms, the railroad and the telegraph would make possible total war on a grand scale that not even von Clausewitz could have conceived of it. Between them, these improvements would culminate in the destructive

In this time of great change, it was perhaps the Prussian Army that took the most correct approach to evolving technologies. By the 1860s, the Prussian Army had not had much in the way of combat experience since the battle of Waterloo. In fact, prior to the Danish War, the Prussian Army had not been in combat since 1815, and even the war against Denmark was not large enough to expose the bulk of the army to combat.<sup>18</sup> If the Prussian Army was to be effective in this time of dynamic change, it would have to find a way to overcome its limitations caused by a lack of experience.

During the Austro-Prussian War of 1866 and the Franco-Prussian War of 1870, the Prussian Army would demonstrate that they had decisively mastered the new technology that was revolutionizing the conduct of war. The keys to success would not be the introduction of some sort of wonder weapon like the needle gun, but rather their success would lie in the introduction of doctrinal advances, which were introduced by the Prussian General Staff and its Chief Helmuthe von Moltke.

The Prussian Army had a permanent staff system in place since 1790.<sup>19</sup> The Prussian *Truppendienst* (or General Staff), by 1870, would become the standard to which all other staffs were measured. In the later half of the 19th century, it would prepare the Prussian Army well for the conflicts to

time of great technological change, it was perhaps this section which would best prepare the Prussian Army, and then the German Army, for wars of the future, from the Franco-Prussian War up to and including the *Blitzkrieg* of WWII.

From the study of Austria's war with Sardinia and France in 1859, the Prussians learned that reliance on defensive firepower could be countered by the use of mobile hard-hitting assault columns. From the American Civil War, the Prussians learned that war with accurate weapons caused egregious casualties. They were also aware that they could ill afford to conduct attrition warfare on the same scale as the Union Army.<sup>20</sup> The Chief of the Prussian General Staff, Helmuthe von Moltke, had personally observed the devastating effects of defensive firepower during the Danish War at the tactical level. In answer to this, von Moltke came up with the doctrine of "strategic offence" with defence at the "tactical level."

In 1865 von Moltke wrote:

*The attack of a position is becoming notably more difficult than its defence. The defensive during the first phase of battle offers a decisive superiority. The task of a skilful offensive will consist of forcing our foe to attack a position chosen by us, and only when casualties, demoralisation, and exhaustion have drained his strength will we ourselves take up the tactical offensive.... Our strategy must be offensive, our tactics defensive.<sup>21</sup>*

Prussian doctrine concentrated on advancing to an area that would most threaten the enemy (e.g., a line of communication or a flank). The Prussians would then go on the defensive. The enemy would subsequently be forced to attack in order to break out or maintain its lines of communication. Then, using the accurate firepower of the rifle, the Prussians would bleed the enemy white and continue the advance on the strategic level.

Von Moltke used this doctrine to great effect in 1866 during the Prussian Seven Week's War with Austria. With the aid of the railway and the telegraph, the Prussian Staff planned and executed

### ***... it was perhaps the Prussian Army that took the most correct approach to evolving technologies.***

deadlock of WWI.<sup>17</sup> Although some armies tried to study the effects of technology on war and bring about doctrine to address it, others did not. Those that did, still did not fully appreciate the implications of the technological advances they were witnessing. The failure to study historical examples of the conflicts between the Civil War and the First World War and to come to grips with them would result in a disaster the effects of which still ripple to this day.

come. The Prussian Staff was unique for that time. Unlike other staffs, it was permanent in peacetime and war. Its organization was also unique in that not only did it have an operational focus, but it also had a very professional railway section, which was charged with making plans for the rapid deployment and mobilization of the army in time of war. It also had a Historical Section, which was tasked to study conflicts of the recent past and provide lessons learned for the Prussian Army. In this

a brilliant deployment. As von Moltke was not aware of the Austrians' intentions, he deployed his forces on a broad 200-mile front.<sup>22</sup> Von Moltke's plan was to make contact with the main Austrian Army in order to pin it with one army, so that he could encircle it and crush it with a second army. However, his intentions did not translate well to the lower echelons, and, although he did deliver a crushing blow to the Austrians, the independent actions of some lower commanders prevented the Prussians from completely encircling the Austrians.<sup>23</sup>

The Austrian plan was to use interior lines of communication to concentrate and destroy the Prussian forces piecemeal, in classic Napoleonic form. Benedek, the Austrian commander, decided to make his stand at Sadowa, approximately 10 miles west of the Elbe River, which constituted a major obstacle. The Elbe had one permanent bridge and one pontoon bridge, which was anchored on the fortress city of Koniggratz (from which the battle takes its name). This latter bridge could provide a withdrawal route for the Austrians should it be required. In order to hold this defensive position, Benedek deployed 215 000 infantry and 750 guns.<sup>24</sup>

The Prussian 1st Army made contact with the Austrian position at 0400 hrs on 3 July. The commander of 1st Army had decided to commence his attack at 1000 hrs after his troops had been rested and fed. This was over-ruled by von Moltke. A delay in attacking and fixing the Austrians might allow them to slip away before 2nd Army could encircle them. Von Moltke instead ordered 1st Army to attack immediately. Unfortunately, von Moltke had no way of knowing that the Austrians had no intention of withdrawing; this unprepared attack would play right into their hands.<sup>25</sup> The battle ebbed and flowed and degenerated into a confusing morass as commanders lost control of their troops. For a time, the Prussians thought that the battle was lost, but von Moltke was unshaken. By noon, 2nd Army threatened the Austrian right; the Austrians were forced to mount costly counterattacks against massed rifle fire in order to delay the Prussians long enough to enable a withdrawal across

the River Elbe. Shortly after the battle, the Austrians conceded defeat and sued for peace. Von Moltke's doctrine had been a success.

After the war, the Prussians went back to study their own effectiveness to see if there were any lessons to be learned. As a result, they moved their artillery from the rear of its columns to the front and deployed their cavalry well forward to conduct reconnaissance. Within four years, the Prussians would be at war again. This time, with the French.

The French, unlike the Prussians, put their trust in technology. The French were convinced that their new .51 calibre Chassepot rifle would win the day. The breech loading Chassepot was superior to the Needle gun in range and accuracy. This was achieved because the breech was sealed with a rubber ring, which dramatically reduced the amount of gas that escaped. They were also placing great stock in what they considered a secret weapon, the *mitrailleuse*, which was a crank-operated machine-gun. It was so cloaked in secrecy that tactics were not developed for its use. It was in fact used as a substitute for artillery, which was still muzzle loaded. This misapplication of the machine-gun would end as a dismal failure. Unfortunately, the lacklustre performance of the machine-gun would cause many to neglect it before the First World War, and a lack of machine-guns would be a handicap at the beginning of the war, specifically for the British.<sup>26</sup> However, it would not be the technological innovations of the Chassepot or the machine-gun that would carry the day; it would be the superior doctrine of the Prussians. Von Moltke used his cavalry as an effective screen to mask the movement of his forces at Gravelotte-St. Privat and Sedan. In both cases, he was able to envelop the French, who were then immediately forced to go on the attack where they were cut down by Prussian defensive firepower.

In two wars against technically more advanced armies, the Prussians demonstrated that it was not technology alone that decided battle but sound doctrine. The key to Prussian

doctrine was that, it was based on historical studies that without bias, examined war and technology to come up with lessons. Rather than treating technological innovations as a panacea, their studies recognized the capabilities and limitations of the current technology and came up with doctrine that employed it to its best advantage.

## STALEMATE AND SLAUGHTER

By 1914, advances in weaponry and the ability to mobilize national resources had outpaced doctrine and common sense. After a spectacular advance to within 40 km of Paris, the German offensive ran out of steam because the Germans had underestimated the power of the machine-gun and the *élan* of the French Army. After the Battle of the Marne, there ensued a race to the sea in order to extend each side's line of trenches. Fighting in the West had stagnated and come to an impasse, leaving a line of trenches that extended 400 miles from the Channel Coast to the Swiss border.<sup>27</sup> In this new type of war, trench warfare, success was measured in metres. It was predicted that at the rate the war was going, it would last well into the 1920s. Fighting resembled medieval sieges, and, in fact, many medieval weapons like the mace, club and battle-axe enjoyed a renaissance. As both sides searched for a solution to the stalemate, the Allies would turn to technology, while the Germans would again turn to doctrine and training. Although in the end it would appear that success lay in advances in technology, doctrine was unquestionably the key to success.

It was the Allies who came to the First World War the most unprepared. Their failure to study the lessons of the Prussian wars against France and Austria had catastrophic consequences in the First World War. The British, who had a great deal of experience fighting colonial wars rather than European wars, drew all the wrong conclusions from what they saw and relied on the tactics they had used to fight poorly trained and armed rebels. The poor performance of the machine-gun during the Franco-Prussian War convinced the British that the machine-gun was of limited use only.<sup>28</sup> It is best

summed up by the words of JFC Fuller who wrote: "We had made up our minds to play whist and when we were sat

when it was put into practice in 1914 was nothing less than a catastrophe. In the first six weeks of the war, the French

## ***In order to break the stalemate of the trenches, the allies turned to technology.***

down we found that the game was poker."<sup>29</sup> Their delay in adopting the machine-gun would prove a cruel handicap in the opening phases of WWI.

The French reaction to technological change was perhaps the farthest removed from reality. They completely ignored the lessons of the Boer War (1899-1902) and the Russo-Japanese War (1904-1905) where the killing power of the machine-gun and magazine-fed bolt-action rifle was aptly demonstrated.<sup>30</sup> The French, who were heavily influenced by the theories of Ardent Du Pict, who wrote about the morale factors of war, thought that they could make up for the increased lethality of weapons through *élan* and aggressive tactics. The French answer to firepower was the *offensive à outrance* (offensive to the limit). The theory was that morale would make an army invincible.<sup>31</sup> The two most influential advocates of this doctrine were Colonel Louis de Grandmaison and General Ferdinand Foch. Colonel de Grandmaison told young officers at the War College: "We must prepare for war by cultivating, passionately, everything which bears the mark of the offensive spirit. To take this to excess would probably still not be far enough."<sup>32</sup> Foch felt that the way to overcome firepower was the massed infantry charge: "To Charge—but to charge in great number—therein lies safety."<sup>33</sup> Foch tried to prove mathematically that this was possible. He figured that in attacking a battalion of 1000 men with two battalions of 1000 men it was possible to get off 20 000 rounds to their 10 000 rounds of defensive fire; therefore success was assured.<sup>34</sup> Nothing was done that might detract from fighting spirit. The French Army maintained its bright blue and red uniforms and infantry was ordered not to dig in under fire. The cavalry, already obsolete, still practised sabre charges. The result of this doctrine

suffered 385 000 casualties, 100 000 of which were deaths.<sup>35</sup>

During the First World War, there occurred yet another RMA. By the end of the war, aircraft would come to play a major part in the battle; strategic bombing would be introduced. The submarine would threaten to strangle Britain, and the aircraft carrier would make its debut. The tank and all arms co-operation would come into its own. This would be the first war where casualties from battle would outnumber those that died from disease. War would change so much in those four years that an officer in 1914 would not understand what was happening in a 1918-type battle. But an officer from 1918 would be well aware of the doctrinal concepts of 1940, or even those of 1991.<sup>36</sup>

In order to break the stalemate of the trenches, the allies turned to technology. The embodiment of that technology was the tank. The tank was a unique development in that, it was the result of a deliberate invention (i.e., the military saw the need to create a machine that could carry them out of the trenches so they turned to industry to create it for them).<sup>37</sup> The tank was designed to beat a path across the trenches for the infantry in a frontal assault.<sup>38</sup> It was first introduced on 15 September 1916, at the battle of the Somme, in the vain hope that it would revitalize the failed offensive. However, the tank's debut proved to be less than decisive. The tank's poor performance was due to many factors: its poor mechanical reliability, the already churned up ground that it

was deployed on, the lack of co-ordination with the other arms, and, finally, the failure to exploit the success of the tank with infantry or cavalry reserves. The Germans also played a significant role in defeating the tank through the use of flexible defensive tactics. At the Battle of Cambrai in November 1917, the tank fared much better, achieving a six-mile penetration. However, the failure to exploit success and aggressive German counterattacks again defeated the tank, and, in fact, pushed back the gains made by the British. In essence, the failure of the tank was not attributable to its technological limitations, although they were a factor, but to the failure of the Allies to change doctrine in order to compliment the capabilities of their new weapon.

The Germans, who had tried and failed to use technology to break the stalemate of the trenches with poison gas, turned instead, as they had in the past, to doctrine in order to break the impasse. The German Army had learned that it was more important to fight on the ground rather than for ground.<sup>39</sup> Consequently, in February 1917, they withdrew to a defensive line on ground of their choosing, giving up more than 1000 square miles to the Allies. This represented a great mental leap forward: the Germans had realized that success



**Technology vs Doctrine.** The Mk V Male was a British attempt to employ technology to break the stalemate of the trenches while the Germans opted for a change in doctrine.



The V2 was the first cruise missile. Cruise missiles, which gained fame in the 1990s, were first envisioned by the American air power prophet Billy Mitchell in 1925.

lay in dispersion and decentralization of command. Essentially, the Germans had decided to fight on ground of their choosing, adapting an elastic defence (or defence in depth). Lower level commanders were now given the initiative to choose where and when to make their stand; they were no longer obliged to stand and die where they stood.<sup>40</sup> The enemy was now allowed to make penetrations into German-held territory where they could be defeated by aggressive counterattacks organized by local commanders. This doctrine was used quite effectively to smash the French Nivelle offensive of 1917, the casualties from which caused the majority of the French Army to mutiny.

This new doctrine depended on cultivating the chaos that is ever present in war. It stressed rapidly exploiting success rather than trying to shore up failure, and pushing control down to the lowest levels rather than trying to slavishly control events from the top. This approach was not without its risks, and it was initially considered too risky by Ludendorff, the German Chief of Staff. However, he accepted the risk and it paid off.<sup>41</sup> The new building block of the German Army was to be the *Stosstruppen* (or storm troops). The storm troop brought manoeuvre down to the section level. Each section was

equipped with its own firebase (i.e., flame-thrower, light machine-gun, or mortar). With sections outfitted as such, they could be used as the ad hoc basis for larger organizations such as companies and battalions, which were tailor-made for each mission.<sup>42</sup> The Germans took younger, fit soldiers out of the line and retrained them in infiltration tactics. The new German tactic placed a great deal of emphasis on surprise through hurricane bombardments, infiltration and bypassing strongpoints, which would be dealt with by slower, more conventional follow-on forces. The objective was the rapid penetration of the enemy's front in order to destroy his artillery and command and control centres.<sup>43</sup> The key to success was the cultivation of chaos, the attacking of weak spots, and the reinforcement of success. In May 1918, the Germans used this new doctrine to achieve a spectacular, by WWI standards, advance. In the first 24 hours of the St. Michael offensive (only the second real offensive in two and a half years on the Western front), the Germans captured 140 square miles at one-tenth the cost of allied casualties at the Somme. (The allies managed to only capture 98 square miles after 140 days).<sup>44</sup> This was carried out without dependence on new technology, but by assessing battlefield conditions and

changing doctrine to suit them. However, the offensive ultimately failed. This failure can be attributed to the fact that the Germans did not keep it supplied or supported with artillery because they were advancing over ground that they had themselves devastated during their withdrawal. Without supplies or artillery support, the advance petered out.

During WWI, there was profound change, not only on the battlefield, but also in society as a whole. In order to supply the vast quantities of material needed to feed and arm armies that numbered in the millions, huge bureaucracies were created to manage every facet of the economy, which was focused on war production.<sup>45</sup> Great strides were made in mass production, which would be carried over after the war to the production of consumer goods, while, at the same time, civilians were being asked to make great sacrifices to fuel the war. Economies were run at their maximum potential in order to fuel a war that, by 1916, had ceased to follow any von Clausewitzian principles; it was simply war fought for the sake of winning, not politics by another means. In fact, the German economy, run by Ludendorff, was run to its breaking point since the production of weapons was carried out at the expense of food production.<sup>46</sup> It is beyond the scope of this paper to identify why Germany ultimately lost the war; however, it is important to note that the war was closely run. At the time the armistice was signed, German troops were still fighting on French, not German, soil. Decision was not brought about on the battlefield, but, rather, on the high seas through the naval blockade of Germany, which caused the collapse of its industry. Although it is clear that an RMA had occurred during WWI, it is ironic that it was scarcely acknowledged as having occurred by its victors after the war. That may in fact explain why, after the war, France, Britain, and Germany all took such wildly different doctrinal paths. However, it was the German doctrine of infiltration that made the most significant strides on the battlefield and which would have the greatest influence on the conduct of future wars.



## MOBILITY AND MECHANIZATION

*Fortresses are not needed by those ...  
that have good armies...but  
fortresses without good armies are  
incompetent for defence.*

—Niccolo Machiavelli, 1531

During the interwar period, Germany, France, and Britain developed three very distinct doctrines. The solutions they came up with were so divergent that one might wonder if they had in fact fought the same war. German doctrine would prove to be the most successful and most enduring.

In 1939 in Poland and in the spring of 1940 in France, the Germans scored two stunning victories that have been held up as the greatest examples of armoured mobile warfare to this day. In the achievement of these two stunning victories, the Germans would give the world a new word, which would come to personify the very essence of a new and dynamic way of war: *Blitzkrieg* (or lightning war). Traditionally, credit for the German victory has been given to the technical aspects of the tank or dive bomber. Others have characterized *Blitzkrieg* as some sort of new revolutionary tactic that the Germans had jumped into while the French and British were stuck attempting to revisit the trench warfare of WWI.<sup>47</sup> The success of *Blitzkrieg* was attributable to neither. Germany's success was the result of a sophisticated, historically-based analysis of what took place on the battlefield of 1918; a professional officer system that evaluated officers on their intellectual ability as well as their tactical ability; the careful, honest, and accurate evaluation of the results of exercises and combat.<sup>48</sup> This was strengthened by the Nazi's ability to indoctrinate their soldiers with the kind of warrior ethos most closely associated with first wave armies.<sup>49</sup>

*Blitzkrieg* was a very straightforward doctrine that today seems elementary. It differed very little from the infiltration tactics of the last war. Using combined arms formations (or perhaps in the lexicon of the 21st century, joint arms), the enemy was overwhelmed in lightening attacks that were directed at defeating its com-

mand, control and communications (C<sup>3</sup>) assets. Attacks on the enemy were designed not to physically destroy, but rather to defeat on the psychological level in order to pre-empt, dislocate, and shatter cohesion or will to fight. First, the Luftwaffe gained air superiority over the battlespace. This ensured that the enemy could not interfere with offensive operations and allowed the air force to act as mobile artillery for the armoured spearheads. Attacks were made on a broad front in order to fix the enemy. Once a breakthrough had been made deliberately in the area where the enemy was weakest, armoured formations would be rushed in to exploit driving deep into the enemy's rear. Enemy strong points would be bypassed and left for conventional follow-on forces to mop up. In advance of this, or simultaneously, airborne forces would seize defiles (i.e., bridges and transportation hubs) that were important to maintaining the momentum of the armoured advance, while at the same time preventing them from falling into the hands of the enemy. The Luftwaffe would now switch to deep strikes, destroying enemy C<sup>3</sup> assets and artillery while at the same time preventing enemy reserves from acting. The Luftwaffe could also act as mobile artillery for armoured spearheads. Armoured formations were equipped with all they needed while mechanized units (i.e., infantry, artillery, engineers and air defence units) were all truck or track borne; logistical units were also mobile. The net result of *Blitzkrieg* was the overwhelming of the enemy's decision cycle and the shattering of his cohesion and morale, thereby forcing him to surrender with little cost. By using this doctrine, the Germans were able to defeat Poland in one month in 1939 and the combined armies of

the basis for US air-land battle doctrine that was used so effectively in the Gulf War.

Henry Beacher Ward said it best when he stated that "[d]efeat is a school where truth always grows strong." The Treaty of Versailles limited Germany to an army of 100 000 men. Germany was not allowed to have tanks or heavy artillery.<sup>50</sup> The force was supposed to limit itself to maintaining internal order and securing the nation's borders. The limitations imposed on the German Army gave them the unique advantage of creating an army from scratch, without being encumbered with either equipment or doctrine left over from the last war. However, the Germans again looked to the lessons of the past to prepare themselves for the next war. Almost immediately following the war, the first Chief of Staff, General Hans von Seeckt, organized no fewer than 57 committees to study what really happened in the last war. He charged his staff to produce:

*Short, concise studies on the newly gained experiences of the war and consider the following points: What situations arose in the war that had not been considered before? How effective were our pre-war views in dealing with the above situations? What new guidelines have been developed from the use of new weaponry in the war? Which new problems put forward by the war have not yet found a solution?*<sup>51</sup>

The roots of *Blitzkrieg* doctrine were worked out by 1923 and later refined. The formulation of this doctrine also benefited from knowledge gleaned from staff visits to the

***Blitzkrieg was a very straightforward doctrine that today seems elementary.***

France and Britain in one month in 1940. This doctrine did not rely on technology to make it work; it was little more than infiltration tactics from the last war, only this time, tanks were used and provision was made for continuous artillery and logistical support. Forty years later, it would form

front carried out during the war.<sup>52</sup> This practice ensured that the doctrine that was formulated was based on actual conditions on the battlefield.<sup>53</sup>

Because Germany did not successfully field tanks during the First World War, they were initially limited to



**The Fritz X was the first precision-guided munition. Primarily an anti-ship missile, it was used to great effect in the Bay of Biscay and was responsible for the loss of HMCS *Skeena* on 25 April 1944.**

studying the works of others on the subject of armoured warfare. For a time, they were influenced by the French concept of armoured forces being used solely to support the infantry; however, they soon rejected this concept. They then studied the theories of the British armoured theorist, Captain B.H. Liddell Hart. However, it was German experimentation and evaluation of war games that would finally result in the formulation of Blitzkrieg doctrine.

As early as 1921, the Germans conducted experimental exercises in the Harz Mountains to test the problems of motorized deployment, with some companies playing the role of tanks. However, because of the restriction placed on the Germans by the Treaty of Versailles, they were forced to make a secret deal with the USSR. The Soviets provided the Germans with training areas to test their theories and develop and test their tank designs. In exchange, the Germans trained Soviet officers at the Kriegsschule. Among them was the future hero of the Soviet Union, Marshall Zhukov. It was from these war games and exercises that General Heinz Guderian formulated the Blitzkrieg doctrine in its final form. In *Panzer Leader* he wrote:

*My historical studies, the exercises carried out in England and our own experiences with mock-ups had persuaded me that tanks would never be able to produce their*

*full effect until the other weapons on whose support they must inevitably rely were brought up to their speed and cross country performance. In such a formation of all arms, the tanks must play the primary role, the other weapons being subordinated to the requirements of the armour.*<sup>54</sup>

Another factor in the German's success was morale. The adjunct to German doctrine was the successful fostering of the fighting or warrior spirit within the German Army. By combining the techniques of the industrial age with the values and skills of the agrarian, through the use of Norse mythology, German fighting effectiveness was enhanced.<sup>55</sup> Spearhead units like the Waffen SS were able to absorb heavy casualties and still continue fighting. While at the same time, there did not seem to be much fight in the French. It was perhaps Hitler himself who expressed it best when, after the battle of France, he said:

*The spending of immense sums of money on the Maginot Line, over a period of many years, has not been without effect on them [the French]; they have been bred on ideas of security. They have lost their dash, which made them our worst enemies in the First World War.*<sup>56</sup>

After the war, the French, who had perhaps suffered the most during the First World War, made a complete volte

face with regard to doctrine. It was as if the spirit of *élan* had been buried along with the unknown soldier at Verdun. The *offensive à outrance* was abandoned in favour of defence based on static fortifications and firepower technology.<sup>57</sup> The French were determined not to let a war, on that scale, take place on French soil again. Study of the battle of Verdun convinced the French that the loss of Fort Douaumont cost them 100 000 casualties, while Fort Vaux, which was garrisoned by a mere 250 men, held up a whole army corps.<sup>58</sup> They also felt that firepower was now the most dominant of the combat functions. The result was the construction of the Maginot Line.

The Maginot Line was a line of forts that stretched for 1500 kilometres, from the Belgium border in the north to the Swiss frontier in the south. The main fortified area was in the north, from Wissembourg to Longwy.<sup>59</sup> The fortifications in this area contained forts with garrisons as large as 1200 men. These forts have been compared to battleships in the ground. They contained disappearing turrets that were connected to a central command and control/fire control room. The defences were mutually supporting and protected by anti-tank obstacles; they were also gas proof. Deep inside the forts, there was a maze of railways, canteens, hospitals and messes. In the area of the Vosge Mountains, there were only scattered blockhouses along the Rhine. The change in defences can be attributed to a lack of funding. However, this was offset by the natural barrier created by the Vosge Mountains. Upon visiting one of the larger *ouvrages militaires* (forts), one cannot help but be impressed by the sense of impregnability and technical sophistication that these forts contained.<sup>60</sup> To this day, there are still maps painted on the walls of the fire-control rooms that show the surrounding terrain with predicted fire calculations to all potential targets. Lord Alanbrooke's thoughts after touring a Maginot Line fort at Welshtenberg in 1940 are perhaps the most telling:

*The fort reminded me of a battleship built on land, a masterpiece in its way, and yet there is no doubt that the whole conception of the Maginot Line is a*



*stroke of genius. And yet! It gives me but little feeling of security, and I consider that the French would have done better to invest the money in the shape of mobile defences such as more and better aircraft and more heavy armoured divisions than to sink all this money into the ground.*<sup>61</sup>

The Maginot line came to personify the fighting spirit, or rather the lack thereof, of the French Army. Behind the mighty forts of the Maginot line, which bristled with firepower and technological marvels, the French Army was content to sit and wait for the Germans to break themselves on its defences. This contributed to a false sense of security and an attitude of complacency that was to be known as the "Maginot Mentality."<sup>62</sup> The defensive character of French doctrine constricted the development of the tank and manoeuvre warfare doctrine within the French Army.<sup>63</sup> Further, the prohibitive cost of the Maginot Line commitment, which precluded money for the development of mobile warfare, made for a situation where no one dared to question the validity of defensive warfare.<sup>64</sup> Some younger officers, like Colonel Charles de Gaulle, tried. In 1934, de Gaulle published his book *Vers L'armée de Métier* (Towards a Professional Army). In it, he advocated the creation of combined-arms, armoured divisions that could be used to invade Germany if it moved against Austria, Czechoslovakia, or Poland. Although he enjoyed the support of some, the minister of war and the army chief of staff would not countenance any change in doctrine; they were content to sit behind the Maginot Line.<sup>65</sup> The result of this doctrine was disaster. During "la drôle de guerre" (Phoney War), while Hitler invaded Poland with the bulk of his army, the French were content to sit behind the Maginot Line conducting what could best be described as "Sitzkrieg." When the Germans did strike, in May 1940, they bypassed the Maginot Line. Those forts that they did attack, such as the Belgium fort of Eben-Emael that guarded the Albert Canal, were easily taken by glider troops, while others were smashed by air attacks from Stuka dive-bombers.

During the interwar years, Britain was beset with antiwar mentality. The government was sensitive to this and

tried to return life to normal as quickly as possible. This meant drastically cutting military spending. The British aversion to war and casualties would lead them to be lulled by unworkable doctrine of deterrence based solely on unproven technology. For the British, the future of war seemed to be in the air.

After the war, the British Parliament, which was keen to return to life as normal as possible as quickly as possible, instituted the dreaded "ten-year rule." In essence, the ten-year rule stated that there would not be a major war for another ten years. Therefore, funding for defence was set appropriately low. The defence priority of the postwar government was the Empire. To his credit, Sir Hugh Trenchard, Chief of the Air Staff, quickly realized that an airforce that did not make itself useful would not be funded. Accordingly, he came up with a role for the RAF defence of the Empire.

As early as 1919, "air control" of the Empire had appeared useful and cost effective. Air control constituted using the RAF to police vast tracts of the Empire with aircraft. If a tribe or village got out of hand, a squadron of aircraft were sent to bomb and strafe them. A typical example was when air power alone was used to dissuade the Imir of Afghanistan from pursuing a holy war against India. Trenchard noted in a memo in 1919 that "since the armistice...[e]vents in the Near East and India have tended to show that against a semi-civilised enemy unprovided with aircraft, aerial operations alone may have such a deterrent effect as to be practically decisive."<sup>66</sup>

Air control of the Empire was a great success. First it impressed upon the government the importance of maintaining an independent airforce. Second, it reduced considerably the cost of policing the Empire. From 1922, when air control was first employed, until 1923, air control had lopped 750 000 pounds from the cost of controlling the Middle East.<sup>67</sup> However, this same doctrine would be adapted by the British as a way of fighting war in Europe, where it was completely inappropriate.

British doctrine, which was put forth by Trenchard, advocated using the independent air arm to strike, not at the manifestations of an enemy's power base (i.e., its weapons), but on the sources of that power: its factories and war workers. That meant the people themselves. Trenchard loosely based this on an unfounded ethnocentric belief that the higher moral fibre of the British people would allow them to withstand bombing more effectively than the Germans or the French. In the 1920's, he stated: "The role of the RAF was to drop the heaviest possible bombload on the enemy, in order to trust their people would crack before ours." He added, "the French in a bombing duel would probably squeal before we did."<sup>68</sup> He extrapolated the results of the lack of material damage inflicted by bombing in WWI to come up with the dictum: "the morale effect of bombing stands to the material in a proportion of 20 to 1."<sup>69</sup>

Of course, this wholly technological approach to war was faulty. It was never tested, nor was it properly evaluated either through the uses of war games or historical analysis of air operations in either the First World War or the Spanish Civil War. The great emphasis that RAF planners had placed on maintaining independence from the other services, namely the army, resulted in neglect of air-land co-operation. Subsequently, during the battle of France, the British found themselves without proper air support. And, when German targets were attacked by British aircraft, they lacked the ability to defend themselves or hit targets smaller than a city. Strategic bombing operations, the cornerstone of British doctrine, were not allowed to get off the ground during the Phoney War, as the British Government was afraid that bombing German cities would cost them American support and the French did not want to risk retaliation.

The British, who introduced armoured warfare in WWI, fared little better on the ground. Many blamed their poor performance on inferior tanks and guns; however, what the British really lacked was good doctrine that successfully integrated tanks with infantry and artillery support.<sup>70</sup> British

doctrine was impeded by interservice rivalry (i.e., the competition for funding between the army, the RAF and the infantry versus the armoured corps). This rivalry caused tank development to be shelved for years. British doctrine, which was based on the theories of Captain B.H. Liddell Hart, although close to German Blitzkrieg doctrine, was too dependant on technology and had not yet made the critical mental leap to all arms co-operation in order to be effective. The cornerstone of British Army doctrine was that infantry divisions, supported by slow, heavily armoured infantry tanks, were responsible for making the breakthrough.<sup>71</sup> Armoured divisions, equipped with lighter armament, were then to dash into the enemy's rear areas, defeat enemy armour and paralyze enemy command, control, and communications, unfettered by the slower artillery and infantry. The infantry

### ***British doctrine was impeded by interservice rivalry...***

divisions were then to follow with their own infantry tanks and mop up all remaining bypassed strong points.<sup>72</sup> This lack of integral support, coupled with the fact that the RAF were not willing or capable of providing close air support, meant the armoured division could not sustain an advance or hold ground if forced to go on the defensive. It was not until late 1942, that the high level of all arms co-operation that had been achieved in 1918 was re-established by Montgomery at El Alamein.<sup>73</sup> However, the requirement to produce several different kinds of tanks meant the British were not capable of producing an effective main battle tank until the end of the war.<sup>74</sup>

By making a realistic assessment of the capabilities of technology and not making technology a panacea the Germans were able to take most of Europe even though they were outnumbered and their technology was initially not as advanced as that of their adversaries. It was only when Germany again lost the war of attrition and her enemies adapted her doctrine that she would lose the war.

## **THE NUCLEAR REVOLUTION**

*Even before the end of the Cold War, it was becoming increasingly obvious that the civilian nuclear "strategists" with their phantasmagoric notions of nuclear war, had sold us a bill of goods. Their arguments that the "atomic age" had rendered obsolete all previous military theories, doctrines, strategies and battlefield experience sent professional military thought into an eclipse that lasted through the Vietnam War.*

—Colonel Harry G. Summers, Jr., 1991

The Second World War ended shortly after nuclear bombs had been dropped on the Japanese cities of Hiroshima and Nagasaki.<sup>75</sup> For many air power pundits, this event represented the fruition of the air power theory. It is important to note that nuclear weapons represent the only RMA that took place solely as a result of a technical advancement. It inspired doctrine that was based on the perceived capabilities of the nuclear weapon. Unfortunately for the US, their potential adversaries were not as impressed with the power of nuclear weapons as they were. This led to the failure of nuclear weapons as deterrents and Western doctrine in both the European theatre of operations and the Third World until the 1980s.<sup>76</sup>

Many thought that nuclear weapons made conventional warfare obsolete. In fact war was thought of as a thing of the past. The thinking was that the cost of waging war in the nuclear age would be so terrible that no one would attempt it. And, accordingly, massive reductions in conventional troop strength followed. Yet war persisted. The USAAF, which already had a doctrine of waging war in accordance with Douhet's vision of a merciless assault on enemy society, accepted nuclear war as their new *raison d'être*.

The USAAF saw its role as being the primary weapon in a strategic balance against the USSR. It therefore paid no attention to its role in the context of the growing number of

conventional wars that were on the horizon. USAAF doctrine therefore remained unchanged. It would continue to use strategic bombers to attack an enemy's social and economic base, which would compel the enemy to submit. That this had not worked in WWII did not change the doctrine.<sup>77</sup> What the makers of nuclear doctrine had failed to do, and what the USAAF had failed to do again, was examine the historical facts from the last war, evaluate its actual technical capabilities, and measure the effects of strategic bombing against the nature of war.

Essentially, the atomic bomb was merely a more cost effective way of doing the same kind of city busting that had been carried out in Germany and Japan in the last war. However, instead of needing 1000 bombers to destroy a city, it would now take only one or two. Although the allies had managed to devastate many German cities, such as Hamburg and Dresden, industrial output in Germany did not fall, nor did the German population decide that bombing was too much to bear and sue for peace. Germany did not capitulate until Berlin was taken by ground forces in a costly battle. The truth was that, although air power was destructive, it was not decisive, and nuclear weapons could not change that. Like earlier claims of non-nuclear air power, the claim being made by the nuclear pundits did not match the actual capabilities.

Essentially, the US did not have the capability to bomb the USSR. By 1948, the US had only 50 nuclear weapons in its arsenal, only 29 bombers capable of carrying them, and only the capacity to prepare two bombs a day for operations.<sup>78</sup> Further, in order to drop the bomb on Hiroshima and Nagasaki, it was necessary to strip all armaments out of the bombers, which left them particularly vulnerable because they were also slow compared to fighters. This was at a time before the bomber had any sort of stealth technology. Only after years of attrition warfare, in the air and after Japanese air defences had been stripped away, was it possible for a bomber to fly unarmed and unmolested to the target. As nuclear war doctrine required targets to be bombed early in the conflict, when the

Soviet airforce would have been at its peak, it is highly unlikely that the bombers would have reached their intended targets.

One final problem with nuclear doctrine was that it failed to take into account the nature of warfare and the nation state. Assuming that strategic planners were correct and the US was able to destroy 500 cities, would the casualties that resulted really have forced a nation like the Soviet Union, which had taken twenty million casualties in the Great Patriotic War against the Nazis, to surrender?<sup>79</sup> Would it really have prevented the Soviets from conducting war in guerrilla fashion? One need only look at their tenacity in WWII and the effects of strategic bombing on Germany to find the answer. Mao Tse-tung summarized it best by saying:

*The atom bomb is a paper tiger with which the US reactionaries try to terrify people. It looks terrible, but in fact is not. Of course, the atom bomb is a weapon of mass destruction, but the outcome of war is decided by the people, not by one or two new weapons.*<sup>80</sup>

Clearly, the faith placed in nuclear weapons, which most consider to be the ultimate technical advantage in weaponry, was unwarranted. It did not prevent the North Koreans or the Chinese from invading South Korea and fighting the Americans to a draw. Nuclear weapons also did not guarantee victory for either the US in Vietnam or the USSR in Afghanistan, both of which constituted major defeats and embarrassments for both nuclear superpowers.

#### POST WAR FAILURE OF TECHNOLOGY

*I see many soldiers; could I but see as many warriors!*

—F.W. Nietzsche, 1885

Since the end of the Second World War, technical sophistication and industrial capacity have failed to be a guarantee of victory in the face of nationalism, superior doctrine, and the warrior spirit. Armies that have put

their faith in technology have continued to be defeated by first wave agrarian armies.

At the end of the Second World War, nationalistic movements spawned by anticolonial sentiments began to flourish. This phenomenon pitted the victors of the last war, second wave, industrialized nations like the US and the USSR, against first wave agricultural

nations like Vietnam and Afghanistan. Of course, during the Cold War, these first wave nations were often client states of either opposing superpower and were supplied with some fairly sophisticated weapons. However, they were never able to bring to the field the same amount of firepower as the second wave nations they were fighting. It was rare that the Vietnamese were able to count on artillery support, and they were never able to get air support, while the US had both in abundance. The Mujahadeen in Afghanistan had neither.

The Vietnam War, which began in 1945 as an anticolonial uprising, is a classic example of nationalism being able to make up for a lack of technical sophistication on the battlefield. The Vietnamese were first able to defeat the French and then the US Army. Although both nations felt that the defeat of the Vietnamese was important, neither nation was willing to mobilize total national support to win the war. In fact, it could be said that American strategy never was one of winning but rather of containment.<sup>81</sup> Rather than make a full commitment to winning the war, the US depended on technology to tip the scales. Their strategy was to make it too painful for the North Vietnamese to continue to wage war in the south. Therefore, the American airforce waded in with Operation "Rolling Thunder". Once again, their approach was classic Douhet air power strategy based solely on technology with the aim of bombing the enemy on the home front into submission. It was sold to the US President as surgical strikes, which would grow with intensity if required.<sup>82</sup>

Unfortunately, there was no industrial infrastructure for the airforce to bomb in the agrarian nation of North Vietnam. Further, there was no way to destroy the North's war-making capability since its forces were dispersed and its weapons were produced in China and the USSR. The result was not only failure, but North Vietnam increased its attacks in the South making it necessary to commit ground troops to protect airfields from

### ***Many thought that nuclear weapons made conventional warfare obsolete.***

attack.<sup>83</sup> In the face of US helicopters, tanks, fighter bombers and massive artillery, the North Vietnamese prevailed, suffering up to fifteen million casualties to finally persevere after a 30-year struggle. The words of General Van Tien Dung describing the fall of Saigon are poignant:

We went into the headquarters of Saigon's General Staff ... Their modern computers containing bio-data on each officer and soldier and civilian were still running. But American computers had not won in this war. The will of our nation had won completely.<sup>84</sup>

By studying the battle of Dien Bien Phu we can see how the North Vietnamese used superior doctrine to make up for technical disadvantage. The French Commander, General Navarre, was faced with conducting an unpopular war. He commanded an army of approximately 190 000, while the Vietminh consisted of 125 000 regular, 75 000 regional troops, with a further 200 000 village militia. Furthermore, of Navarre's 190 000, 100 000 were tied down in static defences.<sup>85</sup> The Vietminh intelligence system had completely infiltrated the French; the French could not move without the Vietminh knowing well in advance. Navarre had inherited a strategy based on strong points and static defences. The aim of this strategy was to hold the strategic rice growing area of the Red River Delta. However, the static defences had proven to be ineffective, and the Vietminh passed at will through those defences. At some strong points, the Vietminh had been tempted to

fight siege battles; however, they had been repulsed by airborne reserves and French firepower from airborne and land-based artillery platforms, suffering heavy casualties in the process. Airborne troops had been used successfully, using their superior mobility to drop on Vietminh supply hubs. Although a great deal of supplies had been destroyed, the Vietminh refused to be drawn into protracted battles. Although, Navarre had seen some success with these tactics, he could control very little and he was running out of mobile reserves to conduct such operations. Navarre's solution was to set up a forward base of operations at Dien Bien Phu that would contain significant artillery firepower and tanks and would be supported by air, for both fire and logistical support. By doing this, he hoped to achieve three aims:

1. Interrupt the harvest of the opium crop, the profits of which were used to buy supplies on the black market.
2. Cut the supply and infiltration route to Laos, which the Vietminh had attacked before and the French were committed to protect.
3. Most importantly, he could lure Giap's elite divisions out of the Red River Delta and destroy them in "Meat Grinder" battles using mobile infantry and armoured battalions in the valley.<sup>86</sup>

He would achieve none of these aims.

General Giap was faced with different problems. He was now well supplied, and his peasant army was fairly well trained; however, it lacked air power. He could never achieve victory if he could not find a way to separate the French from their air power. His doctrine followed the tenets of Mao Tse-tung's theory of revolutionary warfare that called for victory in three stages. In the first stage, the revolutionaries would be on the defensive, using hit and run tactics and trying to survive. In the second stage, the attacks would get bigger, but they would still be hit and run. The aim of the first two stages is to break the morale of the enemy. The third stage would be an all out,

general counteroffensive on the now demoralized enemy.<sup>87</sup> Giap thought that his forces were ready for stage three once before and had been wrong. But now, he thought that they were ready again. Dien Bien Phu represented an excellent opportunity to the Vietminh. With the French at the limit of their air

***... technical sophistication and  
firepower were no guarantee of  
success in the face of highly motivated  
adversaries with good doctrine.***

power and cut off, they could be fixed at Dien Bien Phu while the Vietminh went on the offensive in other parts of Indo-China, specifically the Red River Delta. When the battle of Dien Bien Phu was at its height, the Vietminh were able to operate in daylight in other parts of the country.

The Battle of Dien Bien Phu played out in a predictable fashion; it was an epic siege of a forward base. The valley was 33 square miles.<sup>88</sup> It was comprised of five strong points with interlocking artillery support. It was supplied by two airstrips: one at the main defensive position and the other, five kilometres to the south.<sup>89</sup> The valley was defended by 13 200 French and Vietnamese troops.<sup>90</sup> However, this anvil on which the Vietminh were expected to smash themselves, was quickly surrounded by six divisions of Vietminh who dug in artillery and anti-aircraft artillery and then proceeded to strangle the garrison to death. The siege lasted only 56 days, from March 13th to May 8th 1954.<sup>91</sup> The loss of Dien Bien Phu signalled the end of French colonial control in Vietnam.

The study of Dien Bien Phu provides us with an excellent example of how good doctrine can make up for a lack of technical sophistication and how technical sophistication cannot make up for poor doctrine. Giap was correct in identifying Navarre's centre of gravity (or what von Clausewitz called the hub of all power and movement) as his air power. Once he identified that, he was able to dislocate it. He was then able to fix the French at Dien Bien Phu and strike at the rest of country. However, Navarre was never able to

correctly identify the Vietminh's centre of gravity; as a consequence, he was doomed to failure.

Often, the least considered factor in the success of post WWII insurgents is the warrior spirit. As eluded to earlier, it made a major contribution to the success of the Germans in WWII. It would again play a part in the Soviet defeat in Afghanistan in the 1980's. In 1979, the Soviets invaded Afghanistan to prop up a failing Marxist regime.

Pouring over 100 000 troops into the country, they were able to easily take control of the cities; however, they had not counted on the resistance of the Mujahadeen.<sup>92</sup> The Mujahadeen are a warrior people to whom tales of heroic combat and military exploits are a daily source of pride and honour, and being given a rifle is a sign of manhood.<sup>93</sup> They are willing to fight on their own or in tribal groups. For the Mujahadeen, there is no fear in fighting to the last, and death in battle is considered an honour. The Mujahadeen were never able to fight with even the sophistication of the Vietnamese. Being truly agrarian, tribes often could not combine to fight for more than an afternoon before the demands of family life took them away again. Yet this ragtag group of warriors defeated the mighty Soviet Army and all of its technical sophistication and firepower.

Clearly, in the post WWII world, technical sophistication and firepower were no guarantee of success in the face of highly motivated adversaries with good doctrine.

## AIR-LAND BATTLE AND THE GULF WAR

### *The Indirect Approach*

*The secret of success lies partly in the tactical combination of tanks and aircraft, partly in the unexpectedness of the stroke in direction and follow-through – the way that the break-out (the tactical penetration of the front) is exploited by a deep strategic penetration; carried out by armoured forces racing ahead of the main army, and operating independently. The*



*pace of such forces promises a decisively deep penetration so long as it can be kept up. It is kept up by a torrent like process of advance, either swerving round resistance or piercing it as a weakened spot – in which case the tank torrent contracts in pouring through a narrow breach, and then expands again to its original breadth. It is the persistent pace, coupled with the variability of the thrust, that paralyse the opponent. For at every stage, after the original break-through, the flexible drive of the armoured forces carries simultaneously several threats, while the threat that actually develops into a thrust takes place too quickly for the enemy's reserves to reach the spot before it collapses. In effect, both tactical and strategic surprise are maintained from start to finish. It is the high speed 'indirect approach' to the enemy's rear areas – where his vital but vulnerable organs of control and supply are located.*

–Basil Liddell Hart,  
*The British Way in Warfare, 1932*

The Gulf War of 1991 constituted a stunning victory for the coalition that was brought together to fight Iraq. Many have tried to give credit for this victory to the hi-tech equipment that was brought to bear against the Iraqis. When one thinks of the Gulf War, one is reminded of the images of stealth bombers dropping laser-guided bombs right down the chimney of Iraqi headquarters. We also saw precision-guided munitions (PGM) flying hundreds of miles to strike building-sized targets in downtown Baghdad. Surely no nation could resist an onslaught of such technical precision as that. However, in truth, technology was not wholly responsible for this victory, nor was it all new technology that was used. The victory in the Gulf War was the result of a re-examination of American doctrine after the failure of the Vietnam War, using principles of armoured warfare developed in the 1920s and 1930s coupled with the use of technology, not all of which was new.

After the Vietnam War, the American Army went through an intense period of self-recrimination and self-examination. They had lost in Vietnam, and they were still faced with the possibility of world war in Europe against the Warsaw Pact.

On the European front, the Warsaw Pact could amass a vast conventional force of 100 divisions with 19 000 main battle tanks (MBTs). Against this, NATO could only muster 28 divisions from Denmark to Austria, containing only 6500 tanks.<sup>94</sup> This gave the Warsaw Pact a 3:1 advantage over NATO. In war game after war game, NATO could not stem a soviet attack without turning to the use of nuclear weapons.<sup>95</sup> However, by the mid 1970s, the Soviets had completely discounted nuclear weapons as either a deterrence or war-winning weapon. Marshall N. V. Ogarkov, Soviet Chief of the General Staff, argued that nuclear parity between the superpowers negated the threat of nuclear power and that a protracted war could begin and end conventionally.<sup>96</sup> Ogarkov turned to the 1930s' Soviet strategy of "Deep Battle" as a way to overcome NATO's nuclear arsenal. Deep Battle is defined in the 1936 Soviet field regulations as "attacking the enemy simultaneously over the entire depth of this field force layout with a view to isolating him, completely surrounding him and destroying him."<sup>97</sup> The Soviet plan was to attack on a broad front, achieve breakthrough, then launch operational manoeuvre groups (OMGs) of armour heavy formations to conduct operations in NATO's depth. It was estimated that they would have reached the Rhine by D +13 and would have overrun France and been at the Channel by D +30.<sup>98</sup> The rapidity of their attack and Western political sentiment would have prevented the use of nuclear weapons.

The US was also becoming aware of the fact that the nuclear deterrent lacked credibility. However, there still was a need to come up with a workable doctrine that would take into account the numerical superiority of the Warsaw Pact since NATO did not have the political will to match the Soviets, soldier for soldier. NATO's doctrine of *Forward Defence* in the 1970s was based more on politics than on realistic warfighting capabilities. Forward Defence was insisted upon by the West Germans who insisted that the Warsaw Pact be held as far forward as possible. This plan was reminiscent of Hitler's unworkable "no retreat orders" and was just as unworkable.<sup>99</sup> It forced NATO to fight on unfavourable ground and did

not give NATO the chance to conduct an in-depth defence, which was the proven method of defence since 1917.

The most influential force in reshaping US doctrine was General William E. DePuy, who was the commander of Training and Doctrine Command (TRADOC) in 1973. He was a WWII veteran who, like great shapers of doctrine before him, turned to an examination of history in order to develop the doctrine of the future. He saw the lessons of WWII as being more relevant to a conflict in Europe than to the wars in Korea and Vietnam. He directed his staff to conduct a comprehensive study of the 1973 Middle East conflict, the Yom Kippur War. From the Yom Kippur War, DePuy surmised that the destructiveness and pace of modern war had increased, while American doctrine had not. He concluded that the US Army would have to be retrained, starting at the lowest levels and working up the chain of command. His aim was to get the US Army to think about combat as a problem of weapons systems integration.<sup>100</sup> As a result, bold initiatives were to come out of TRADOC and, in 1976, FM 100-5 was issued. It would constitute the first iteration of air-land battle (ALB) doctrine.

At the same time, airforce officers, like Colonel John Warden, began to rethink the failure of air power in Vietnam and came to the conclusion that there was something wrong with the way that the airforce was thinking about war.<sup>101</sup> They began to move away from the theories of Mitchell and Douhet and began to realize that air power could not simply supplant the other arms. Air power was therefore best used where it could affect the ground battle and the campaign as a whole. They felt that air power should be used to strike at the enemy's centre of gravity and to strike at the enemy's C<sup>3</sup> assets and forces in depth. Rather than using air power to bypass ground warfare, it was to be used in a systematic approach in co-operation with ground forces.<sup>102</sup>

However, the problem remained as to how to handle Warsaw Pact second echelon forces in Europe, from which

would come the forces that would overwhelm NATO at the tactical level and from which would spring the OMGs. A way had to be found to allow NATO to separate and delay or destroy the second echelon from the first, before it could become a threat. One theory was follow-on forces attack (FOFA). FOFA was designed to strike up to 300 km into the enemy's depth with massive air strikes for the purpose of delaying, disrupting and destroying enemy follow-on forces.<sup>103</sup> It was envisioned that lucrative targets could be found at choke points, like river crossings and railheads, where troop concentrations would be found. FOFA would also supplant the need for nuclear weapons. It fostered the development of new technologies to detect and monitor enemy movements up to 50 km away—like the Joint Surveillance and Target Acquisition Radar System (JSTAR)—as well as new ballistic and cruise missile technology. However this strategy operated to the exclusion of ground forces.

The best hope for success was ALB because it combined both the ground and air forces in an integrated systems approach to warfighting. ALB called for corps commanders to launch deep strikes up to 150 kms forward of the forward line of own troop (FLOT) in support of manoeuvre operations. The idea of ALB was to force the enemy to fight on the defensive throughout his depth through the flexible employment of manoeuvre, electronic warfare, and conventional, nuclear, and chemical weapons on an extended and integrated non-linear battlefield. Retaining the initiative, and synchronizing combat functions, breaking up enemy arms combinations, trading space for time, and generally avoiding attrition war were all facets of ALB.<sup>104</sup> In order to make this doctrine work, the manoeuvrist or indirect approach, which was advocated by Liddell Hart in the 1920's and 1930's, enjoyed a renaissance.<sup>105</sup> The irony of the ALB is that it bears a striking resemblance to the *Blitzkrieg* doctrine of WWII. However, ALB was never tested in the European theatre of operations; its test would come in the deserts of Kuwait.

When ALB was unleashed on the Iraqis, it was devastating. The Coalition faced, what was then, the fourth largest army in the world, comprising upwards of 50 divisions that had been battle

hardened during ten years of conflict with Iran.<sup>106</sup> After a six-week air offensive, which followed the principles of Colonel Warden's doctrine, the Coalition launched a ground offensive that crushed the Iraqi Army in 100 hours.

As eluded to earlier, a *prima facie* examination would credit the victory of the Coalition to US air power and the high tech weapons it utilized; however, that is a fallacy. Only 10% of the bombs dropped by the Coalition were PGM, and, further, most Iraqi armoured vehicles were destroyed by highly trained Coalition tank crews using quite conventional weapons.<sup>107</sup> In fact, many of the high tech weapons used in the Gulf had their roots in WWII. The laser-guided bomb had its roots in the German Fritz X bomb of WWII, which was a radio-guided bomb that sunk several allied ships. The USAAF also had similar bombs during and after the war in the form of the AZON and TAZON, both of which were ignored by the bomber barons, but which had scored some spectacular successes on bridges that had resisted earlier attempts to be bombed.<sup>108</sup> They were used again with some success in Korea; however, further development was shelved with disastrous results in the coming Vietnam conflict because conventional wisdom dictated that nuclear war would make PGM unnecessary. The cruise missile also received a lot of attention, while its use had been envisioned by General William Mitchell as early as 1925, and the Germans had fired over 9200 at Britain during the Second World War.<sup>109</sup> This was, however, the first war where space-based systems played a significant role with regards to reconnaissance and the Global Positioning System (GPS). These systems allowed commanders at all levels to navigate rapidly across the desert, thus contributing to the synchronization of the Coalition effort. And stealth technology, which was able to defeat Iraqi air defences, was also highlighted. But it was not technology that provided the decisive stroke in this conflict.

What were not highlighted were the long years of training that were carried out by the largely professional armies of the Coalition. Nor was there much attention paid to the war games and rehearsals that were carried out in Saudi Arabia before the ground offensive

started. It was noted that some of the armoured engineer vehicles that made the breach carried fascines reminiscent of the trench-crossing equipment used at Cambrai in 1917. What occurred in the desert was the combination of doctrine, which came about as a result of historical analysis, and technology, which had evolved over the decades, coming together in balance. It was also a victory for all arms co-operation, which had been demonstrated so successfully in 1918 and in 1940, but which had been forgotten since then.

## CONCLUSION

Throughout the history of warfare, armies have been tempted to look to technology to deliver to them a decisive edge in battle. Certainly, technology has played no small role in bringing success to the battlefield. However, technology and doctrine must exist in balance against the backdrop of the timeless character of war. Nations that have tried to use technology as a silver bullet in war have been defeated time and time again by nations lacking in both numbers and technological sophistication. While at the same time, those nations that have ignored the effects of technology have done so at their peril and have paid the price. Further, there is a danger in ignoring the lessons of the past in the belief that advances in technology have made all that has gone before irrelevant. It is only from study of the past that we can hope to predict the future, as demonstrated by von Moltke, Von Seeckt and DePuy.

As we stand in the midst of the latest RMA, which is being driven by advances in information and computer technology, we must ensure that we don't place too much stock in the promises of information warfare pundits. We should take care not to place too much emphasis on the technological aspects of the future that they are predicting, lest we forget the lesson of the past and the timeless nature of war. We must formulate a workable doctrine that will harness the new technology with war winning doctrine.



## ABOUT THE AUTHOR...

Major John Malevich holds B.A. in Political Science from the University of Western Ontario. He is presently pursuing a Masters of Arts in War Studies at RMC. He is an Armoured Officer of the LdSH(RC) and has served in Germany, on exchange in the UK, and has completed two tours in Bosnia and Herzegovina. He is currently employed at J7 Doctrine, Lessons Learned and Standardization.

## ENDNOTES

1. David Jablonsky, *The Owl of Minerva Flies at Twilight: Doctrinal Change and Continuity and the Revolution in Military Affairs*, Carlisle: Strategic Studies Institute, 1994, p. 4.
2. Robert Bateman, *Digital War: A View From the Front Lines*, Navato: Presidio Press, 1999, p. vii.
3. Jablonsky, p. 12.
4. Bateman, p. vii.
5. *Ibid.*, p. viii.
6. Alvin and Heidi Toffler, *War and Anti-War: Survival at the Dawn of the 21st Century*, Toronto: Little Brown and Company, 1993, p. 32.
7. Dr Robert J. Bunker, "Generations, Waves, and Epochs: Modes of Warfare and the RMA," *Airpower Journal*, Spring 1996, p. 4.
8. Bunker, p. 4.
9. Toffler, p. 32.
10. Jablonsky, p. 9.
11. Trevor N. Dupuy, *The Evolution of Weapons and Warfare*, New York: Da Capo Press, 1984, p. 196.
12. Dupuy, p. 191.
13. Chris Perello, "The Quest for Annihilation," *Command*, September 1994, p. 31. A union medical study found that only eight percent of all casualties had been caused by artillery.
14. Dupuy, p. 197.
15. Williamson Murray, "Thinking About Revolutions in Military Affairs," *Joint Force Quarterly*, Summer 1997, p. 71.
16. John Keegan, *A History of Warfare*, New York: Alfred A. Knopf, 1993, p. 360.
17. Sir Michael Howard, "How Much Can Technology Change Warfare," *Strategic Studies Institute*, July 1994, p. 2.
18. Paul Dangel, "The Seven Weeks War," *Command*, March 1992, p. 15.
19. Martin Van Creveld, *Command in War*, Cambridge: Harvard University Press, 1985, p. 109.
20. Dangel, p. 16.
21. Dupuy, p. 199.
22. Allan D. English et al, *The Changing Face of War*, Montreal & Kingston: McGill-Queen's University Press for the Royal Military College of Canada, 1998, p. 42.
23. English et al., p. 43.
24. Dangel, p. 26.
25. *Ibid.*, p. 28.
26. Dupuy, p. 200.
27. Ted Raicer, "1914 Glory's End," *Command*, August 1994, p. 32.
28. Dupuy, p. 200. The German and British both had only two machine-guns per battalion; however, the Germans also had *jager* battalions with six machine-guns per battalion.
29. JFC Fuller, taken from Jablonsky, p. 10.
30. Perhaps the greatest lesson of these two conflicts was that the high accuracy of infantry and smokeless powder made linear formations and bayonet charges impossible. In fact, the Japanese siege of Port Arthur demonstrated that trench warfare and barbed wire was the way ahead and that the increased lethality of weapons made life above ground very dangerous indeed.
31. Raicer, p. 18.
32. *Ibid.*, p. 18.
33. *Ibid.*, p. 18.
34. English, p. 82.
35. *Ibid.*, p. 82.

36. Murray, p. 72.
37. William H. McNeill, *The Pursuit of Power*, Chicago: University of Chicago Press, 1982, p. 330.
38. Dupuy, p. 221.
39. English, p. 85. This is perhaps the hardest lesson for students of tactics to understand. Although ground is fought over, it is of itself not important. There is no need to hold a hill to the last man if there is a better hill to the rear that is more easily defensible. However, if the Commander's intent is to carry out a delaying action on your hill, in order to prepare a defence in depth, then defence of that piece of ground makes sense. However, ground in and of itself is worthless. The Allies did not learn that lesson until after the war.
40. English, p. 85.
41. *Ibid.*, p. 85.
42. Ted Raicer, "Storm in the West," *Command*, June 1992, p. 24.
43. *Ibid.*, p. 24.
44. English, p. 87.
45. McNeill, p. 331.
46. McNeill, p. 339.
47. Howard, p. 74.
48. Robert H. Scales Jr., "Future Warfare," *Strategic Studies Institute*, May 1999, p. 2.
49. Howard, p. 5.
50. Janusz Piekalkiewicz, *Krieg der Panzer 1939-1945*, Munich: Gmbh and Co, 1981, p. 9.
51. James s. Corum, *The Roots of Blitzkrieg: Hans Von Seeckt and German Military Reform*, Lawrence, Kans.: University Press of Kansas, 1992, p. 37. Taken from Howard, p. 74.
52. Van Creveld, p. 173. During the German Army's reform during WWI, the Chief of Staff, Gen Kuhl, instituted a policy of sending his staff officers to the front on a regular basis with questions that had to be answered, e.g., what was needed, what was this situation? The Germans used the regional basis of their regiments to ensure that staff officers would encounter friends that would give them an honest assessment of the situation. Van Creveld calls this the directed telescope.
53. Howard, p. 74.
54. Heinz Guderian, *Panzer Leader*, London: Michael Joseph Co, 1952, p. 24.
55. Howard, p. 5.
56. Alistair Horne, "Breakthrough at Sedan," *History of the Second World War*, Part 5, 1978, p. 116.
57. Bateman, p. 165.
58. English, p. 87.
59. English, p. 87.
60. This was evident even in the early 1990s. It seems as if nothing were left to chance. To this day, turrets still raise and lower electronically or by hand should the power fail.
61. Barrie Pitt, "Prelude to Disaster," *History of the Second World War*, Part 1, 1978, p. ix.
62. Barrie Pitt, p. ix.
63. Piekalkiewicz, p. 20.
64. Bateman, p. 165.
65. Piekalkiewicz, p. 19.
66. AIR 8/2 memorandum.
67. Peter Paret, *Makers of Modern Strategy*, New Jersey: Princeton University Press, 1986, p. 633.
68. Tami Davis Biddle, "British and American Approaches to Strategic Bombing," *The Journal of Strategic Studies* 18, 1, 1995, p. 99. In the 1920s, France looked like the most probable enemy in the next war.
69. John Terraine, A Time For Courage, *The Royal Air Force in the European War, 1939-1945*, New York: Macmillan Publishing, 1985, p. 9.
70. Steve Rothwell, "From All Tanks to All Arms: The Evolution of British Armour Doctrine," *Command Issue* 52, p. 27. This is a common misconception. In fact, until about 1943 with the appearance of the Panther series, German tanks were technically inferior to French, British and Russian tanks in muzzle velocity and armour thickness. In fact, many of the tanks used in the battle of France were training tanks armed with little more than machine-guns.
71. Piekalkiewicz, p. 17.
72. Steve Rothwell, p. 26. In 1940, there were only two infantry battalions, one artillery regiment, one anti-tank regiment, and one engineer regiment in an armoured division. There was nowhere near the amount of support required for an armoured division.



73. Steve Rothwell, p. 27.
74. The main battle tank is a combination of firepower, mobility and protection in balance. A prime example of this was the Russian T 34 or German Mk IVJ. The British were forever hampered by tanks that were too heavily armoured with no mobility or killing power or tanks that were fast, moderately armed, but had no protection. This would create a great deal of problems throughout the war and would slow down the development of effective doctrine.
75. It is debatable whether this ended the war with Japan. Although it gets most of the credit for ending the war, some believe that it was the risk of being overrun by the Soviets, who had recently entered the war against Japan and who had inflicted 900 000 casualties on the Japanese in Manchuria, that caused the Japanese to sue for peace.
76. George and Meredith Friedman, *The Future of War*, New York: Crown Publishers, 1996, p. 77.
77. George and Meredith Friedman, p. 228.
78. *Ibid.*, p. 76.
79. *Ibid.*, p. 76.
80. Allen S. Whiting, *China Crosses the Yalu*, Palo Alto, Calif: Stanford University Press, 1960, p. 135. Taken from George and Meredith Friedman, p. 84.
81. George and Meredith Friedman, p. 228.
82. Michael Maclear, *The Ten Thousand Day War*, Agincourt, Ontario: Methuen Publications, 1981, p. 126.
83. Michael Maclear, p. 126.
84. *Ibid.*, p. 349.
85. Edgar O'Balance, *The Indo-China War*, London: Faber and Faber, 1964, p. 195.
86. Edward Doyle, Samuel Lipsman, and Steven Wiess, *The Vietnam Experience, Passing The Torch*, Boston: Boston Publishing Company, 1981, p. 63.
87. Edward Doyle, Samuel Lipsman, and Steven Wiess, p. 49.
88. *Ibid.*, p. 77.
89. *Ibid.*, p. 77.
90. *Ibid.*, p. 77.
91. *Ibid.*, p. 77.
92. James F. Dunnigan and Austin Bay, *A quick & Dirty Guide to War*, New York: Quill, 1986, p. 100.
93. *Ibid.*, p. 188.
94. English, p. 158.
95. David Miller, *The Cold War: A Military History*, New York: St Martins Press, 1998, p. 348.
96. English, p. 156.
97. Field Regulation 1936, Poltevoi ustav 1936, p. 112. As cited by Frederick Kagan, *Army Doctrine and Modern War: Notes Toward a New Edition of FM 100-5*, Parameters, Spring 1997, p. 136.
98. Miller, p. 359.
99. Robert Leonhard, *The Art of Manoeuvre: Manoeuvre Warfare theory and Airland Battle*, Navato, CA: Presido 1991, p. 132.
100. Leonhard, p. 130.
101. George and Meredith Friedman, p. 258.
102. *Ibid.*, p. 258.
103. English, p. 165.
104. *Ibid.*, p. 166.
105. The manoeuverist approach could take up another paper. Essentially, it advocates hitting the enemy at the weak spot rather than at the enemy's strength. It also advocates the issue of mission-oriented orders, which tell a commander what to do rather than how to do it. Getting within the enemy's decision cycle is also stressed. The overall idea is that a smaller force can defeat a larger one by fighting "smarter."
106. English, p. 188.
107. *Ibid.*, p. 188.
108. James F. Dunnigan, *Digital Soldiers*, New York: St. Martin's Press, 1998, p. 127.
109. Dunnigan, p. 147.



101st Airborne Division (Air Assault) and 3rd Battalion Princess Patricia's Canadian Light Infantry Battalion Group soldiers participate in an awards ceremony led by Gen. Eric Shinseki, the U.S. Army Chief of Staff at Kandahar Airfield in Afghanistan on 6 April 2002. Shinseki awarded medals to American soldiers who participated in Operation "Anaconda." This operation commenced on 2 March 2002 to destroy al-Qaeda and Taliban fighters in fortified cave and bunker complexes in the lower Shah-i-Kot valley of eastern Afghanistan. Friendly ground forces included elements of the 10th Mountain Division, 101st Airborne Division, the 3rd Battalion Princess Patricia's Canadian Light Infantry Battalion Group and Afghan government troops. The fighting lasted 11 days with coalition troops facing not only what one soldier described as a determined enemy, but also steep terrain, poor weather conditions that limited air operations over a three-day period. Heavy physical demands in oxygen-poor high altitudes added to the challenge of the operations.

*U.S. Army photo by Specialist George Allen, 314th Press Camp Headquarters.*

# Historical and Contemporary Issues of Homeland Defence

## Countering Terrorism: A Ground-Based Air Defence Perspective

by Lieutenant-Colonel Christopher Kilford, CD

### INTRODUCTION

The 11 September 2001 terrorist attacks on the World Trade Center in New York and the Pentagon in Washington D.C. caused Canadians to significantly re-evaluate their security needs, both at home and abroad. Indeed, in the aftermath of the attack, new anti-terrorist legislation was quickly introduced, and the Canadian government soon became a willing partner in the war on terrorism. Of course, this was not the first time Canadians had been forced to become more vigilant. During the Second World War, both the Germans and the Japanese threatened the country with air attack, and some 250 Japanese balloon bombs floated into Canada and the United States carrying incendiary bombs. Then, during the Cold War, Soviet bombers, and later ballistic missiles, targeted North America.

Now it was the turn of international terrorism and the unease about what might happen next that was enough for the Natural Resources Minister to tell the media that the government was considering whether military personnel, armed with surface-to-air missiles, should guard Canada's nuclear facilities from terrorist attack.<sup>1</sup> Meanwhile, in the United States, a widely publicized report from The Heritage Foundation Working Group entitled *Defending the American Homeland* called upon the Secretary of Defense to deploy air defence and cruise missile defence systems around major cities and critical infrastructure in the United States.<sup>2</sup> While an attack on the scale of the one in New York seemed

less and less likely in the weeks and months following 11 September 2001, there was a realization that even a small aircraft dispensing a chemical or biological weapon or one converted into a flying bomb could be deadly.

With the potential for future air attacks in mind, the aim of this paper is to discuss the historical precedents for defending Canadian airspace with ground-based air defence (GBAD) during the Second World War and then the Cold War. Then, and more importantly, the war on terrorism will be addressed by examining the air threat, the potential targets that terrorists might choose, and how to determine what should be defended and when. This latter focus will take the reader away from the classic military threat prioritization of criticality, vulnerability, and recuperability, and give anyone entrusted with the homeland GBAD task a new approach to counter a new threat.

### DEFENDING CANADIAN AIRSPACE – THE SECOND WORLD WAR

In 1936, and in light of German rearmament, the Canadian militia went through a period of reorganization and modest growth. The three existing anti-aircraft sections in the Canadian Army were expanded and renamed the 1st, 2nd, and 3rd Anti-Aircraft Batteries. In Montréal, the 5th Battery was added to

Aircraft Battery was created in Kingston in 1937 as a permanent force unit. Its role was to provide anti-aircraft specialists, instructors, and training for the militia, yet the Battery had to wait a year before its four 3-inch guns arrived from England. In fact, the Chief of the General Staff noted in a memorandum to the government in January 1937 that there was "not a single modern anti-aircraft gun of any sort in Canada."<sup>3</sup>

One year after the 4th Battery was formed, the Joint Staff Committee approved a report on the "Forms and Scales of Attack on Canadian Seaports and Inland Centres." In the report, the Committee, after conducting a threat assessment, determined that air attack could be expected on:

- The Pacific Coast. A definite risk of torpedo, bomb or gas attack. Maximum twelve aircraft from enemy ships.
- The Atlantic Coast. As for the Pacific Coast, with the definite risk of attack from one airship dropping 25-30 tons of bombs.<sup>4</sup>
- The Inland Centres (Montréal, Ottawa, Toronto). Slight risk of bomb or gas attack by aircraft from enemy ships.

To provide air defence for the above, the Committee determined that 116 heavy anti-aircraft 3.7-inch guns, 30 light anti-aircraft 40-mm Bofors guns, 120 searchlights, and 120 sound locators were needed. While obtaining these guns would prove difficult, by November 1943, 156 heavy and 280 light anti-aircraft guns were ultimately deployed in Canada, as new

***... Canadians had been forced to become more vigilant.***

the 2nd Montreal Regiment and the 1st (Yorktown) Light Anti-Aircraft Battery was formed. Finally, the 4th Anti-

potential targets were identified. Among the new targets was the Arivida, Quebec aluminium plant that supplied 90% of the aluminium ingots needed for the Commonwealth air industry. The American and Canadian canals at Sault Ste. Marie, connecting Lake Superior and Lake Huron, were also considered vulnerable. The Americans were so concerned with possible sabotage or air attacks on the Sault Locks that they guarded the area with sixteen 90-mm guns, thirty-two 40-mm guns, a barrage balloon battalion (with 54 balloons), and a series of early warning observation detachments in Northern Ontario. Canada added four 3.7-inch guns under command of the Americans.<sup>5</sup>

When Japan entered the war in 1941, the anti-aircraft defences along the Canadian Pacific coast barely existed. Within 10 days of the attack on Pearl Harbour, however, the first three 40-mm Bofors produced in Canada were rushed to Esquimalt, and, by November 1943, the naval docks were protected by 12 heavy and 18 light anti-aircraft guns.<sup>6</sup> In the end, four anti-aircraft regiments, with a combined strength of 187 officers and 3467 other ranks, defended the Pacific Coast. Seven regiments defended Eastern Canada and the Atlantic Coast, with 303 officers and 5439 other ranks on strength.<sup>7</sup> However, by the summer of 1943, an increasingly favourable strategic outlook in Europe led to a general reduction in the war establishments of anti-aircraft units. After the invasion of Normandy in June 1944, cutbacks occurred as rapidly as possible, and "by the end of that year of victories the great structure of coast and anti-aircraft defences built up in the early part of the war had largely been dismantled."<sup>8</sup> Three months after the fall of Japan, the last remaining anti-aircraft units on the Pacific Coast disbanded.

#### DEFENDING CANADIAN AIRSPACE – THE COLD WAR

Unlike the years following the First World War, Canada's anti-aircraft

organization in the immediate post-war period was reasonably well established, and "the militia, and its complement of anti-aircraft regiments was, by pre-war standards, positively lavish."<sup>9</sup> In 1946, a total of nine heavy anti-aircraft and 18

### *The importance of anti-aircraft defence for Canada grew considerably with the threat posed by the Soviet Union after 1945.*

light anti-aircraft regiments plus nine anti-aircraft operations rooms (AAOR) could be found in the Reserves. In the Regular Force, four composite batteries were formed, two in Esquimalt and two in Picton, Ontario. Added to this was the Royal Canadian School of Artillery at Picton, which separated from the School of Artillery (Coast and Anti-Aircraft) in Halifax. In total, 449 heavy (3.7-inch) guns, 624 light (40-mm) guns, and 77 fire-control radars were available. On paper, this was a formidable force when compared with the pre-war situation, yet many of the reserve units had on strength only 25% of their authorized personnel.

The importance of anti-aircraft defence for Canada grew considerably with the threat posed by the Soviet Union after 1945. In 1948, a Joint Intelligence Committee appreciation described the threat in the following terms:

Although, as far as is known, there are no bases in North Eastern Siberia at present capable of handling sustained B-29 type operations, it is estimated that fields now in existence could handle up to 100 B-29 type aircraft for a very limited period. This would bring the northwest sector of this continent as far as Seattle, Vancouver and Edmonton within the range of two-way air attacks from Siberia. In addition, it is possible for one-way air attacks to cover all the industrial areas of North America from both Siberia and Murmansk.<sup>10</sup>

Beyond 1948, the same document noted, "all forms of offensive operations open to the USSR will continue, with improved efficiency and increased scale, to be possible in the predictable future." To plan an adequate defence of North

America, the Royal Canadian Air Force (RCAF) and the Canadian Army had to co-ordinate their efforts. To facilitate co-operation, Anti-Aircraft (AA) Command was formed in April 1949, with its headquarters in Chatham, New Brunswick; when the

RCAF moved its Air Defence Group Headquarters to St. Hubert, Quebec in December 1949, AA Command followed.

As the Cold War began, many Vulnerable Areas (VA) were identified in Canada that would need protection from air attack. From Port Radium in the Northwest Territories to the North Saguenay Power Area in Quebec, these locations formed an initial list for planning purposes. In addition, air defence requirements for northern airfields designated as staging bases for American strategic bombers and Canada's brigade-sized Mobile Striking Force were considered—in essence, protection for the Forward Operating Locations and Bases (FOLs/FOBs), as they are known today. The RCAF would also begin planning for an early warning system, implement a network of ground-control interceptor stations and air-defence fighter fields, and closely coordinate everything with the United States.<sup>11</sup> Certainly, planning was the order of the day for the air defenders:

An almost unending stream of plans was formulated—plans for protecting one set of vital points, plans for protecting a different set of vital points, plans for relocation of reserve force units, plans for moving equipment—mountains of paper and hours of work into the continually changing plans for Canada's AA defence. The target date for readiness was to be 1 July 1954, and certainly if hostile aircraft

could be stopped by paper, Canadians might well have felt confident in their defenses long before that date.<sup>12</sup>

But all the future plans and purchases designed to improve Canada's anti-aircraft defences, especially at home, would soon come to a crashing halt. At a Chiefs of Staff Committee meeting, in November 1954, the Defence Research Board representative presented a study pointing out that the large destructive radius of nuclear weapons made close-in anti-aircraft defence somewhat futile. Later, a 1958 RCAF study determined that "during the period 1960-65 cruise-type missiles would constitute a threat to North America."<sup>13</sup> More tellingly, it was determined that "in addition to the bomber threat, the Soviets could, under the most favourable conditions, produce intercontinental ballistic missiles by 1960 and such weapons would constitute a major threat by 1965.... The nature of the defense against such a threat is not known."<sup>14</sup>

Therefore, on 29 March 1955, the Chiefs of Staff Committee decided that anti-aircraft guns for the defence of Canada were no longer needed. Essentially, the entire organization would be reorganized to meet the needs of the army field force only, effectively placing "the control of whatever artillery or missiles that may be developed to meet the new threat" against the North American continent squarely in the hands of the air force.<sup>15</sup> As a result of this decision, the air force introduced the first surface-to-air missile (SAM) organization for the air defence of North America. The 446 SAM Squadron formed on 28 December 1961 in North Bay and the 447 Squadron followed on 15 September 1962, at La Macaza, Quebec. Both squadrons had 28 nuclear-tipped, *Bomarc* anti-bomber missiles (600 km range with a 10 kt warhead). Any bomber within 1000 m of the warheads detonation, it was anticipated, would be destroyed by the blast. But the *Bomarc* missile was, in turn, phased out when intercontinental ballistic missiles displaced the bomber threat. As a result, both squadrons disbanded in September 1972.

## DEFENDING CANADIAN AIRSPACE – THE WAR ON TERRORISM

Today, NORAD carries out the air defence of North America and no Canadian GBAD units take part. Indeed, that Canada has a GBAD capability at all is itself remarkable. In 1960, and despite being aware of the Soviet air threat in Europe, all Canadian GBAD units were disbanded in both the Regular Force and the Militia. For the next fourteen years, Canada had no air defence capability whatsoever, and it was only through pressure from NATO, that a small, largely ineffective capability was re-introduced in 1974. In the early 1980's, however, renewed pressure from NATO and the planned deployment of new CF-18 fighters into Europe caused the CF to embark on a project to completely upgrade its air defences. Following a stringent evaluation process, Oerlikon-Bührle of Switzerland was selected, in 1986, to supply 36 air defence anti-tank systems (ADATS), 10 *Skyguard* radars, and 20 GDF-005 35-mm guns to the army. From 1988 onwards, Canada could claim to have a robust and very effective air defence capability against all manner of targets. Today, and despite several reorganizations and reductions in manpower, this capability remains—albeit a very small one.

The army units assigned the GBAD role are largely responsible for defending military assets and spend the majority of their time training with other military units. However, defending a fixed military asset, such as an airbase or a large headquarters, is not that different from defending a similar civilian asset. And, as such, Canadian air defence personnel would have, for example, no difficulty defending a nuclear power facility from air attack. However, the real challenge for anyone contemplating the deployment of air defence assets within Canada is how to determine what the threat is and what the potential targets are that terrorists might choose. Indeed, we must ask the military air defence experts to cease thinking like Soviet era bomber pilots and begin imagining themselves as resourceful, uncompromising people who are willing to give their lives for whatever motive they may have.

## DETERMINING THE AIR THREAT

There is little doubt that we, in the West, often fail to comprehend what motivates terrorists to do what they do, especially if it involves their own deaths. There is also little doubt that the terrorist air threat to Canada could one day come in the form witnessed on 11 September in New York. Certainly, we should appreciate that there is nothing like a successful terrorist mission to encourage others to adopt the same *modus operandi*. But the planning and effort needed to carry out the 11 September attacks was considerable, and while this alone should not allow us to dismiss another similar attempt being tried in the future, there are far easier means to accomplish similar results. Instead, air defenders must concentrate their efforts on identifying and engaging smaller aircraft that have been configured as flying bombs. Given the number of these aircraft in the sky each day, and the close proximity of airports to potential key targets, the time required for NORAD fighters to intercept a potential terrorist aircraft simply is not available so air defence missile and gun systems are vital.

Of course, the term *small aircraft* covers a wide range of air platforms and, for the purposes of this paper, includes aircraft from small Cessna propeller driven airplanes to business jets, like the Global Express. These, or similar aircraft, could be flown into a target without any enhancements. Or they could be outfitted with explosives such as RDX timed to go off immediately or on a delayed basis to maximize penetration and destruction. Configured in such a manner, a small aircraft takes on destructive qualities potentially in excess of those possessed by larger, *unprepared* commercial aircraft. Table I gives some examples of the types of aircraft that could be used by terrorists.

## DETERMINING THE TARGETS

Ground-based air defence doctrine tells us that "there will be insufficient numbers of Air Defence weapons and sensors available to protect all forces and assets."<sup>16</sup> Indeed, the job

of an air defender is infinitely difficult in any offensive or defensive scenario since the location of own troops can change in minutes, as can priorities. From a homeland defence perspective, potential terrorist targets are almost always fixed and are well known to government agencies such as the Office of Critical Infrastructure Protection and Emergency Preparedness (OCIEP), which is a civilian organization operating within the Department of National Defence. However, the dilemma for OCIEP, in a country the size of Canada, is simply accounting for the limitless number of potential terrorist targets.

As Paul Knox pointed out in *The Globe and Mail*, prioritizing threats in the military is something of a science:

You look at the potential target's importance, its vulnerability and how easy it would be to repair or replace. You know you can't defend everything with the same degree of certainty, and you're prepared to accept the destruction of non-essential installations. Among civilians, risk assessment is more difficult. Unlike soldiers, civilians aren't signed up for possible tactical sacrifice, so you can't write off targets – not publicly anyway.<sup>17</sup>

Mr. Knox does have a point, but there are simply not enough GBAD assets or aircraft in NORAD to protect every piece of Canadian infrastructure. Nor are passive air-defence measures of potential targets, such as using camouflage, always practical. However, our prospects of defeating a terrorist threat can be reduced significantly if we know what to defend and why. With this in mind, Table II outlines six generic target categories. Table III then provides a list of potential targets and the categories into which they fit. The targets most likely to be attacked by a terrorist will fit into most if not all categories. Finally, based on Table III, three general target types can be identified:

- **Infrastructure targets** – for example, pipelines, bridges, road networks, buildings, and communications nodes.
- **Nuclear Targets** – nuclear reactors or nuclear weapons

located on Canadian territory. Within this target type can be included some chemical plants producing more dangerous chemicals (like chlorine) whose destruction would cause effects similar to that of a nuclear incident.

- **Symbolic Targets** – for example, Canadian government or international conferences and major national and international sporting events.

Each of these general target types will now be discussed in detail.

### INFRASTRUCTURE TARGETS

There are any number of buildings, bridges, pipelines, power lines, and other infrastructure in Canada that could be considered as terrorist targets. In October 2001, Daniel Lewis was charged after he allegedly fired a bullet at a section of the Trans-Alaska oil pipeline, causing some 70 000 gallons of crude oil to spill over the ground

north of Fairbanks.<sup>18</sup> Although not a terrorist act, this incident gives some idea of how effortless it is to disrupt infrastructure targets without resorting to elaborate means. Car or truck bombs are another way to easily damage buildings, as we have seen all too often.

As Paul Knox writes, "it sounds callous to say it, but comparatively little stopped for very long when the World Trade Center was destroyed."<sup>19</sup> In essence, he is right, despite, as he notes, the tremendous psychological effect this terrorist attack created. Indeed, the day after the attacks, life went on; the initial belief that casualties would climb well above the 10 000 mark was eventually unfounded. World markets, which had been weak since March of 2001, also proved more resilient than first imagined. Just two months after the collapse of the World Trade Center, both the DOW and TSE 300 reached their pre-11 September

closings. Of course, there was a significant economic cascade effect (Category III). Within the worldwide airline industry, layoffs and near bankruptcies became a weekly occurrence, and job losses in the United States were significant—in October alone 415 000 jobs were lost. However, this spike in the October United States unemployment rate to 5.4% was only half the nearly 11% rate reached during the 1981-82 recession—the steepest downturn in the post-Second World War period.

While this particular portion of the essay should not be construed as a complete dissertation on the economic impact following 11 September, it does help illustrate how resilient North America's economy can be. While the job losses are high, Glen Somerville (Reuters) noted in a November 2001 article that the American economy was soft anyway before 11 September and in August job losses exceeded 50 000.<sup>20</sup> In essence, the attack on the World Trade Center came at just the right time—

***There are any number of buildings, bridges, pipelines, power lines, and other infrastructure in Canada that could be considered as terrorist targets.***

during a slight downturn after a period of tremendous economic growth. Thus, if the conclusion is that America cannot be brought to its knees by a terrorist attack on the scale of 11 September, and terrorists are going to spend time and effort planning another attack from the air, infrastructure targets like the World Trade Center are probably no longer that appealing. In military jargon then, infrastructure targets are not likely as high a payoff as some might originally have thought.

### NUCLEAR TARGETS

Construction of Canada's first nuclear power generating station began in 1965. Today, 15% of the Canadian electricity supply comes from nuclear energy—Ontario alone obtains 50% of its electricity needs by this means, with Point Lepreau station supplying 30% of New Brunswick's power.<sup>21</sup> In Canada,

there are 25 CANDU nuclear reactors of which 22 are dedicated to electric power production (although only 14 are currently in operation); the remainder are used in research or for educational purposes. In comparison, France has 53 nuclear reactors in use and the United States operates 103.<sup>22</sup>

The CANDU nuclear reactors at Pickering A (whose restart has recently been proposed) were designed to have one fast shutdown system (2 seconds) and one slower secondary system (10 seconds). However, at Pickering A and B all eight reactors share the same containment system, which is only designed to absorb the stored energy and radioactive decay heat from one single reactor. The same can be said of the emergency coolant injection system, which is shared by all eight reactors but only has enough coolant for one accident at one reactor. In addition, at the Bruce B facility, some 330 000 spent uranium fuel bundles are stored in an 11-metre deep Olympic-sized pool. As Brad Faught reported, when shown the site, the bundles gave off an eerie blue glow from the cobalt they release, "making this water a deadly elixir of radioactivity."<sup>23</sup> In other locations, fuel bundles are stored above ground in concrete containers.

Whenever nuclear safety is discussed, our attention is quickly drawn to Three Mile Island in the United States and Chernobyl in the Ukraine. Unit 2 at the Three Mile Island site suffered a partial meltdown due to a cooling malfunction on 28 March 1979. Although there was a radiation leak, there were no direct casualties. However, the possibility of long-term negative health effects on those living near Three Mile Island has been the subject of debate in the United States for decades. Far worse an incident was the one that took place in the Ukraine on 26 April 1986. The explosion and subsequent release of radiation from the Chernobyl reactor created frightening effects. Immediately, 31 plant workers were killed in the explosion and some 6000 workers in the clean-up crews succumbed to radiation poisoning. In all 100 000 square kilometres became contam-

inated.<sup>24</sup> But this was not all, and since the accident there have been severe health repercussions on the local population throughout the contaminated area, including an increasing incidence of thyroid cancer in children born after April 1986.<sup>25</sup>

Determining how many casualties one might expect from a nuclear accident in Canada is difficult to determine. In October 1987, when it appeared the Canadian military might acquire nuclear powered submarines, Dr. W. Jackson Davis wrote a report entitled "Nuclear Accidents on Military Vessels in Canadian Ports: Site-Specific Analyses for Esquimalt/Victoria."<sup>26</sup> In the report, he described what might happen if a 100 megawatt naval propulsion reactor suffered a meltdown in a port area. For the residents of Victoria he concluded that:

Although Short-Term casualties under the generally conservative assumptions of this analysis are relatively low, [the accident] modeled would cause from hundreds to thousands of Long-Term casualties unless the contaminated urban areas were both evacuated and decontaminated. The most significant impact, however, could be economic. U.S. Government studies indicate that decontamination could cost tens of billions of U.S. dollars and take months to complete, during which time the local economy would be largely terminated.<sup>27</sup>

Given the above, and what we know from the aftermath of the Chernobyl accident, there is almost irrefutable evidence that a damaged Canadian nuclear reactor would cause large numbers of short- and long-term casualties, sharply disrupt the economy, and, likely, have a cross-border impact on the United States. Tens of thousands of people live in and around the Pickering and Darlington nuclear power generating sites. These reactors also provide Ontario with a significant amount of electrical energy. Any terrorist attack would certainly create an economic cascade that would spread beyond Ontario, especially if large sections of Toronto were contaminated.

## SYMBOLIC TARGETS

The final target category includes both national and international symbolic targets. As we know, American Airlines Flight 77 crashed into the Pentagon, and it is likely that United Airlines Flight 93, which crashed at Somerset, Pennsylvania, was destined for the White House or the Capitol building. Certainly, the attack on the Pentagon was a symbolic act directed at America's military might. And, perhaps just as important, the attacks on the World Trade Center and the Pentagon resonated around the world because they were both powerful symbols of Western economic and military strength.

Within Canada, there are few symbolic targets that a terrorist would attack, and, if they did so, the world-wide *resonance factor* would likely be quite insignificant. We are a middle power of unassuming stature, with few, if any, well-known international symbols. We have no Statue of Liberty and no Mount Rushmore—24 Sussex Drive is not the White House. From an international perspective, only the CN tower, and to a lesser extent the Parliament Peace Tower, are reasonably well known outside Canada. As a result, terrorist attacks on symbolic targets, although not impossible, are doubtful.

However, from time to time Canada has sponsored international conferences of one sort or another. Be it the International Monetary Fund, NATO ministers or G8 conferences, these activities would be of interest to terrorists. And given the security measures taken to prevent protesters from getting too close, air attack offers the best means to disrupt meetings. Protecting important conferences from air attack is not new in North America. Indeed, when Roosevelt, Churchill, and Mackenzie King met in Quebec City in August 1943, anti-aircraft guns ringed the site. Still, this does not mean that every conference, international sporting event, or other activity needs air defence protection. There are some activities that are more important than others, and we should expect terrorists to be systematic and careful in their choices.



## COMPARING TARGET TYPES

At this point, it is useful to summarize the three target types identified in this paper—**infrastructure** targets, **nuclear** targets, and **symbolic** targets. In essence, infrastructure targets are numerous in Canada and can readily be attacked without resorting to a carefully planned terrorist air strike. Protecting some infrastructure targets with air-defence guns or missile systems is possible, if adequate intelligence were available for a just-in-time deployment; but in general terms infrastructure targets do not present the terrorist with a high payoff. While terrorist air attacks on our infrastructure cannot be ruled out, this method is far too complex when easier means are available. Instead, we should expect terrorists to consider attacking nuclear sites and symbolic targets in that order. Unquestionably, nuclear reactors present the best targets, and a reactor meltdown, and likely subsequent events, fits most of the target categories outlined in this paper.

An attack on a nuclear site could be catastrophic, and, until safety measures can be guaranteed at each operating reactor site, it would be prudent to consider deploying air defence systems. Indeed, multiple air strikes against one or more reactor sites would be devastating. In a typical single aircraft scenario, if a large commercial jet or a small business jet approached a nuclear reactor at 1000 kph and was detected by an air defence radar at 10 kilometres, the air defence operators would have upwards of 40 seconds to sound the

alert, have the reactor shut down, and then safely engage the target. It might even be possible to mount radars at each reactor site that would automatically shut them down if an aircraft came too close—however, this would not prevent the aircraft from still hitting the reactor building.

With regard to symbolic targets, it would be prudent once again to plan for air defence. The knack is in determining when to deploy. A G8 Conference, or similar event, is an easy choice and would top the list for air defence protection. But what about a Grey Cup game or a political convention? This evaluation would be a matter for the Canadian Intelligence and Security Service, with the actual deployment of air defence systems a matter for the Cabinet to decide. However, in the end, it is evident our nuclear reactors are the most vulnerable of the potential targets discussed.

## WHAT TO DO?

To reduce the potential for future terrorist air attacks to succeed, there are several measures that can be taken from a GBAD perspective. Certainly an air defence officer could be seconded to OCIPPEP, either permanently or in an advisory capacity, to assist in threat analysis. A complete reconnaissance of each nuclear reactor site or the most dangerous chemical production plants, in order to determine likely air approach routes (based on the inherent vulnerabilities of each site), could also be carried out. This would form the

basis of a deployment plan in the event that an air attack was expected.

Passive air-defence measures could also be implemented to protect nuclear reactors, including the reinforcement of containment systems or the deployment of barrage balloons (with steel, wing cutting cables, or in a steel net configuration). If air defence systems could not be deployed permanently around nuclear sites, then each nuclear site could have a surveillance radar that would automatically cause the reactor(s) to shutdown if an aircraft penetrated the surrounding airspace. More recently, Raytheon, in the United States, proposed that their rapid-fire Phalanx Block 1B gun systems be used to protect domestic infrastructure sites.<sup>28</sup>

Indeed, passive methods may be the only solution given that our present GBAD capability is insufficient to meet the needs of the army or air force now, let alone being deployed for homeland defence—and even this small GBAD capability is set to all but disappear once the army completes its plans for future re-organization. In any event, it is useful to remind ourselves at this juncture how shocked and surprised we all were on 11 September 2001. In the army we are taught to expect the unexpected and, in turn, make every effort to surprise the enemy. Well, the unexpected happened. We were the surprised. Let's hope it doesn't happen again.



TABLE I – AIRCRAFT CHARACTERISTICS

Aircraft	Speed	Weight	Fuel capacity	Remarks
Boeing 767-300	848 kph	69 680 kg	90 770 litres	American Airlines Flight 11 crashed into the World Trade Center, North Tower. United Airlines Flight 175 crashed into the South Tower.
Boeing 757	974 kph	88 000 kg	43 400 litres	United Airlines Flight 93 crashed at Somerset, Penn. American Airlines Flight 77 crashed into the Pentagon.
F-4 Phantom	2300 kph	24 000 kg	5000 litres	
Global Express	1064 kph	38 000 kg	16 482 litres	
Lear Jet 60	850 kph	9400 kg	2733 litres	
Cessna	228 kph	980 kg	200 litres	On 12 September 1994, Frank Corder stole a single-engine aircraft and crashed it on the grounds of the White House. On 28 May 1997, Mathias Rust flew a Cessna from Helsinki, Finland and landed in Red Square. On 6 January 2002, Charles Bishop flew his Cessna 172 into the 28th and 29th floors of the 42-story Bank of America building in Tampa, Florida. During his flight, Bishop flew over McDill Air Force Base—home to CENTCOM, the headquarters running the war in Afghanistan. NORAD was not aware of Bishop's suicide flight until 10 minutes after he crashed; it is unlikely that they could have responded anyway.
Twin Otter	224 kph	5000 kg	1000 litres	
Jet Ranger III	208 kph	1280 kg	300 litres	Helicopter
UAVs (Sentry)	50 kph avg.	100 kg	23 litres	Pilot-less air vehicle

TABLE II – AIRCRAFT CHARACTERISTICS

Target Category	Description	Remarks
Category I	A target that if attacked would cause short-term casualties.	< 1000 casualties.
Category II	A target that if attacked would cause long-term casualties.	> 1000 casualties.
Category III	A target that if attacked would have a low-cascade economic effect.	These are targets whose destruction will have a limited effect on the national economy.
Category IV	A target that if attacked would have a high-cascade Economic effect.	These are targets whose destruction could have wide-ranging effects on a national and indeed global scale.
Category V	A target that if attacked would have cross-border (United States) implications.	Targets located in Canada whose destruction will have a major impact on the United States either through casualties or for economic reasons (or both).
Category VI	Symbolic targets.	Targets such as the Parliament buildings or international conferences held within Canada (G8 or NATO for example). International sporting events like the Olympics would also be included.

TABLE III – TARGET EXAMPLES

Target Examples	Target Category	Remarks
Major bridge	I and III	In January 2002, the federal government decided to inspect the structural strength and resistance to impact of 14 major bridges throughout the country.
Oil or gas pipeline or distribution centre	I and III	Using Alberta as an example, we have key energy installations, such as Edmonton's Refinery Row and Fort Saskatchewan's petrochemical plants, and 293 799 km of pipelines. <sup>1</sup>
Buildings similar to the World Trade Center (each tower was 110 stories)	I and III	BCE Place in Toronto consists of the Bay Wellington tower (47 stories) and the Canada Trust Tower (51 stories).
Nuclear reactors	I, II, III, IV, and V (if located near the United States)	<p>Nuclear power generating stations in Canada:</p> <p>Bruce A (Ontario) with 4 reactors  Bruce B (Ontario) with 4 reactors  Pickering A (Ontario) with 4 reactors  Pickering B (Ontario) with 4 reactors  Darlington (Ontario) with 4 reactors  Gentilly-2 (Quebec) with 1 reactor  Point Lepreau (New Brunswick) with 1 reactor</p> <p>Bruce A and Pickering A are currently out of service. Many smaller nuclear reactors are also in operation in Canada, mainly for research purposes.</p>
Chemical manufacturing plants or transportation of dangerous chemicals	I, II, III, IV, and V (if located near the United States)	<p>On 3 Dec 1984, gas leaking from a tank of methyl isocyanate at a plant in Bhopal, India killed almost 4000 people and injured/affected some 400 000.</p> <p>On 10 November 1979, a 106-car train carrying dangerous chemicals derailed in Mississauga, Ontario causing the evacuation of 250 000 people for almost one week and the closure of 25 square kilometre area surrounding the derailment site.</p>
Foreign nuclear-powered vessels making port calls	I, II, III, IV, and V	Surface and sub-surface vessels with nuclear-powered propulsion and possibly nuclear weapons aboard do make port calls in Canada.
Parliament buildings	I and VI	
Conferences	I, III, IV, VI	The G8 annual conference is an example.
Sporting events	I, III, and VI	Any major sports event, such as the Super Bowl, can serve as an example. During the World Cup, stadiums in South Korea will be protected by fighter cover and anti-aircraft systems.

<sup>1</sup> Rachel Evans, "Alberta Terrorist Target?" *The Edmonton Sun*, 26 November 2001.

## ABOUT THE AUTHOR...

Lieutenant-Colonel Christopher Kilford was born in England and immigrated to Canada in his youth. Following graduation from high school, he joined the Regular Force. After training as a radio technician, he served with the 8th Canadian Hussars in Petawawa, Ontario. In 1981, Lieutenant-Colonel Kilford applied for officer training and was accepted as an artillery officer. He has served with the 3rd Regiment Royal Canadian Horse Artillery, 128th Airfield Air Defence Battery (in Germany), the Air Defence Artillery School, Land Force Command Headquarters, 18th Air Defence Regiment, and Land Force Central Area Headquarters. Lieutenant-Colonel Kilford was commanding officer of the 4th Air Defence Regiment in Moncton, New Brunswick until August 2001, when he became a member of the National Securities Staff at the Canadian Forces College in Toronto. He is a graduate of the Canadian Land Forces Command and Staff College. In October 1992, he successfully completed a Bachelor of Arts Degree from the University of Manitoba. He is currently completing a Masters Degree in the War Studies Program. Lieutenant-Colonel Kilford's first book, *Lethbridge at War*, was published in 1996 and in 2000 he won first prize in the Royal Canadian Artillery's Colonel Geoffrey Brooks Memorial Essay Competition. He is currently National Security Studies Course Coordinator at the Canadian Forces College in Toronto, Ontario.

## ENDNOTES

1. Andrew McIntosh, "Missiles may guard nuclear facilities, Minister says," *National Post* 4, 7, 3 November 2001, p. A3.
2. "Defending the American Homeland: A Report of The Heritage Foundation Homeland Security Task Force," Chaired by L. Paul Bremer III and Edwin Meese III, Washington D.C: The Heritage Foundation, 2002, p. 75.
3. L.R.N. Ashley, "Flying Officer, The Air Defence of Canada," *Air Historical Section*, RCAF HQ Vol. II, 1958, p. 268.
4. The Joint Staff Committee had good reason to worry. In 1937, the German airship Hindenburg had innocently flown over Halifax on its regular flight to New York. It was later determined that a number of German aerial reconnaissance experts aboard the airship had photographed the entire harbour, citadel, and other military sites.
5. Col G.W.L. Nicholson, *The Gunners of Canada, Volume II, 1919-1967*, Beauceville, Québec: Imprimerie L'Éclaireur, 1972, p. 496.
6. "Assessment of Canadian Air Defence Requirements Including Canadian Army Anti-Aircraft Artillery Participation", HQS 501-0-3 FD 6 (DDAA) 12 July 1948, p. 3.
7. *Ibid.*, Tables I and II.
8. Ashley, p. 271.
9. Michael Slack and Martin Shadwick, "Low Level Air Defence: The Canadian Dimension," *Canadian Defence Quarterly* 14, 1, Summer 1984, p. 23.
10. "Assessment of Canadian Air Defence Requirements Including Canadian Army Anti-Aircraft Artillery Participation," HQS 501-0-3 FD 6 (DDAA) 12 July 1948, p. 1.
11. *Ibid.*, p. 3.
12. Canada, Department of National Defence, "A.A. Defence of Canada" HQTS 2270-3 (DMO&P[2]), 3 February 1951.
13. Canada, Department of National Defence, "Report of USAF-RCAF Military Characteristics Committee - DEW Group," National Archives, RG 24, Vol. 8087, File 1272-39 (Vol. 2), p. 4.
14. *Ibid.*, p. 4.
15. Ashley, p. 272.
16. Canada, Department of National Defence, "Air Defence Artillery Doctrine," B-GL-372-001/FP-001, p. 56.
17. Paul Knox, "Attack of the Security Zealots," *The Globe and Mail*, 7 December 2001, p. A21.
18. Ben Speiss, "Bullet Pierces Pipeline," *Anchorage Daily News*, 5 October 2001.
19. Knox, p. A21.
20. Glen Somerville, "October Job Losses Worst in Two Decades," *Reuters*, 2 November 2001. Internet at <http://www.publicbroadcasting.net>.
21. Canada, The Standing Committee on Energy, the Environment and Natural Resources, "Canada's Nuclear Reactors: How Much Safety is Enough? Interim Report," June 2001, p. 1.
22. Brad Faught, "Nuclear Surprise," *National Post Business Magazine*, October 2001, p. 104.
23. Faught, p. 102.
24. David R. Marples, "Chernobyl's Toll after Ten Years: 6,000 and Still Counting," *Bulletin of Atomic Scientists*, May/June 1996, p. 1. Internet at <http://www.bullatomsci.org/issues/1996/mj96/marplesoped.html>.
25. *Ibid.*, p. 3.
26. This report is available on the Internet at [http://www.ccnr.org/nuke\\_subs.html](http://www.ccnr.org/nuke_subs.html)
27. *Ibid.*, p. 3.
28. Andrea Shalal-Esa, "Raytheon hopes to show off gun system at U.S. sites," *Reuters*, 5 February 2002.

# Warfighting Essay Competition

## ANNUAL WARFIGHTING ESSAY COMPETITION

In 2000 the *Army Doctrine and Training Bulletin* sponsored its first warfighting essay competition. The aim of the competition was to provide a competitive forum for Army personnel serving throughout the Canadian Forces and those interested in army issues to express their thoughts and opinions in a competitive environment. For the 2001 competition, two prizes were offered: \$250.00 for first place and a \$100.00 voucher from Vanwell Publications for the second best paper.

Submissions were received from Regular and Reserve Force officers and non-commissioned members. It was planned to announce the winners earlier this year, but operational matters made it difficult to assemble the judging committee. When it finally met, the judging committee included Brigadier-General G.A. Nordick as Chair, with members Lieutenant-Colonel Alan Markewicz from the Directorate of Army Doctrine, Captain James McKay representing the Directorate of Army Training and Dr Sean Maloney as the academic member. The Managing Editor of this Bulletin served as Secretary.

What follows are the two prize winning papers for the second annual *Army Doctrine and Training Bulletin* Annual Warfighting Essay Competition. Details for the next competition will be provided in the coming months.

The Managing Editor would like to extend thanks to all entrants for participating, to the members of the judging panel for their fair and impartial work and to Vanwell Publications for their continued support of the *Army Doctrine and Training Bulletin*.

## "Some Terrible Surprises": Chemical Weapons and Manoeuvre Warfare

by Second-Lieutenant Mark Gaillard  
*First Prize 2001 Warfighting Essay Competition*

"Chemical warfare must enter into our future provisions and preparations, if we do not wish to experience some terrible surprises."<sup>1</sup>

—Marshal Ferdinand Foch, 1921

"You can take the most beat-up army in the world, and if they choose to stand and fight, you're going to take casualties; if they choose to dump chemicals on you, they might even win."<sup>2</sup>

—General Norman Schwarzkopf, 1991

### INTRODUCTION

For Canada's Army, the year 1997 was significant for two reasons. In that year, after more than a decade of debate, manoeuvre warfare was adopted as its

warfighting doctrine. Also in that year, the *Chemical Weapons Convention*,<sup>3</sup> an international treaty banning chemical warfare and to which Canada is a state party, came into force. The timing is coincidental, but the two kinds of warfare are inextricably linked.

### HOW IS MANOEUVRE WARFARE LINKED TO CHEMICAL WARFARE?

The purpose of manoeuvre warfare is to defeat the enemy by disrupting his ability to act, rather than by physical destruction of his forces.<sup>4</sup> The theory draws its power mainly from opportunism—the exploitation of chance circumstances and winning the battle of wills by surprise and, failing this, by speed and aptness of response.<sup>5</sup> As such, it is a warfighting philosophy that seeks to shatter the enemy's

cohesion through a variety of rapid, focused and unexpected actions, which create a turbulent and rapidly deteriorating situation with which the enemy cannot cope.<sup>6</sup>

Chemical warfare is "the employment of chemical agents to kill, injure, or incapacitate for a significant period of time, man or animals, and deny or hinder the use of areas, facilities or materiel; or defence against such employment."<sup>7</sup> Despite its banning by means of the *Chemical Weapons Convention*, chemical warfare is a key feature for many states in the developing world which have been developing doctrines of asymmetric response to the superior conventional manoeuvre warfare capabilities of Western developed countries. Minister without Portfolio in the Israeli Government Dan Meridor, in an address on the character of future warfare to the National Security College in Tel Aviv on September 11, 2001, noted that, in

view of Israel's significant edge in conventional warfare, the Arab states have shifted warfare to a new level he called “supra-conventional,” meaning that chemical and biological weapons will be used immediately to counter their enemy's military superiority on the battlefield.<sup>8</sup> In an echo of Foch's advice, he suggested that, if Western forces intend to fight their wars based upon manoeuvre warfare doctrine, there is an equivalent need to prepare to fight and win in a chemical environment.<sup>9</sup>

Current Canadian Army doctrine on nuclear, biological and chemical defence<sup>10</sup> notes that “a potential enemy

fact that chemical weapons are “supra-conventional” weapons and, as such, are the most effective tactical means available to enemy forces to oppose manoeuvre warfare. Their main purpose is not “mass destruction” but to “slow the tempo of operations.”<sup>14</sup>

#### SLOWING THE TEMPO OF OPERATIONS

**M**anoeuvre warfare is based on quickness, flexibility and opportunism and seeks to reduce the friction that impedes the attacking side. Through spatial and temporal manoeuvre, the attacking force achieves decisive moral, mental and physical superiority

producing a kind of friction that is inconceivable unless one has experienced war.... Countless minor incidents... combine to lower the general level of performance, so that one always falls far short of the intended goal... The dangers inseparable from war and the physical exertions war demands can aggravate the problem to such an extent that they must be ranked among its principle causes.<sup>20</sup>

In war, friction may be moral (e.g., fearful, exhausted and demoralized troops), mental (e.g., leadership indecision or lack of initiative) or physical (e.g., effective enemy fire or a terrain obstacle that must be overcome). Internal friction is self-induced by such factors as lack of a clearly defined goal, lack of co-ordination, unclear or complicated plans, complex task organizations or command relationships or complicated technologies. External friction is imposed by such factors as enemy action, terrain, weather or just plain bad luck and can be used to slow the tempo, to eliminate surprise, to induce hesitation and indecision among leaders, and to inflict psychological casualties or a fear of such casualties to demoralize and immobilize soldiers.

#### HOW DID CHEMICAL WARFARE SLOW THE TEMPO OF THE FIRST WORLD WAR?

**S**ummarizing the role of chemical weapons in the First World War in his 1937 book, *Achtung-Panzer!*, Heinz Guderian wrote:

The original forms of gas were designed to facilitate the attack, and were comparatively transient. Very soon, however, the combatants began to employ persistent agents which contaminated the ground over a particular length of time, and so facilitated the defensive. The principle substance in question was the so-called “Yellow Cross,” also termed mustard gas. It was not long before chemical weapons became an inevitable presence on every battlefield.<sup>21</sup>

Chemicals were seen as near-perfect friction weapons. Brigadier-General A. A. Fries, the United States

### ***... Western forces ... need to prepare to fight and win in a chemical environment.***

with a nuclear, biological and chemical capability may introduce weapons of mass destruction anywhere within the spectrum of conflict and at any stage when it is to his perceived advantage.”<sup>11</sup> Designating chemical weapons as being “weapons of mass destruction” obscures their true function and purpose. Tactically, chemical weapons, by their nature, have a relatively limited range. Chemical weapons agents can, and have been, effectively delivered by modified conventional munitions such as aerial bombs, artillery rockets, artillery shells, grenades, mines, mortar rounds and missile warheads. Their killing power is relatively small, and effective protective countermeasures exist. Chemical weapons were developed and employed in past wars, particularly during the First World War, not to create mass casualties and death but to degrade the military efficiency of units and soldiers in the field.

Chemical weapons would thus be better designated as “weapons of intimidation” against troops.<sup>12</sup> Unlike NATO doctrine, which notes that “NATO operations must be planned and conducted against a background of the risk of their employment against its forces,”<sup>13</sup> this Canadian tendency to dwell exclusively on the “weapons of mass destruction” aspect overlooks the

over an enemy at the necessary time and place. Especially important is time. The manoeuvrist force operates at a faster tempo than the enemy in order to gain a decisive temporal advantage.

In manoeuvre warfare, as noted in the U.S. Marine Corps *Warfighting* manual, “tempo is itself a weapon—often the most important.”<sup>15</sup> The word “tempo” is a term borrowed from Soviet doctrine and is generally taken to mean “the rate of progress towards accomplishment of the mission.”<sup>16</sup> Tempo can be defined as “the distance from the initial line of contact to the back of the final operational/tactical objective, divided by the time from the receipt of orders by the operational/tactical commander to the accomplishment or abortion of the mission.”<sup>17</sup> More simply, tempo is “speed over time—the consistent ability to operate quickly.”<sup>18</sup>

Opposing tempo is friction—the force that resists all action and saps energy.<sup>19</sup> In his 1832 book *Vom Kriege* (*On War*), the great Prussian military theorist Carl von Clausewitz described the concept he termed “friction in war”:

Everything in war is very simple, but the simplest thing is difficult. The difficulties accumulate and end by



Army officer who headed the U.S. Chemical Warfare Service after the First World War, predicted a bright future for chemical weapons:

One great reason why chemical warfare will continue is that it fills a long-felt want on the part of the soldier; that of shooting successfully around a stump or rock. The gas cloud is inescapable. It sweeps over and into everything in its path. No trench is too deep for it, no dug-out, unless hermetically sealed, is safe from it. Night and darkness only heighten its effect. It is the only weapon that is as effective in a fog or in the inky blackness of a moonless night as in the most brilliant sunshine. Only the mask and the training that go with it protect.<sup>22</sup>

Historians have noted the physical effects of First World War chemical warfare on soldiers:

The soldiers' only protections were alertness, battle intuition, early warning, gas masks, anti-gas appliances, and endless drill and practice.... The personal isolation from comrades; the nagging suspicion that one's gas mask could fail, have a hole in it, or be lost; the near-blindness and the noxious smell; the vomiting and nausea produced by even mild gassings; the poisonous contamination of trenches and dug-outs by mustard gas; and the difficulty of carrying out normal tasks like working, shooting, drinking, eating, smoking, and defecating under such conditions weighed on all soldiers of the Western Front enveloped by the gas environment.<sup>23</sup>

To those unfortunate soldiers in the front-line, "poison gas," as chemical weapons were then called, "made life uncomfortable, to no purpose."<sup>24</sup> For their commanders, there was a military purpose. Chemical warfare was an effective weapon because it could degrade the cohesion and reduce the fighting efficiency of the enemy. Brigadier-General Fries concluded that, when chemical warfare is used against the enemy, it's not the gas but the "terror, confusion, lack of discipline and control [that] are fatal."

By the last half of the war chemical weapons were used in every engagement—from company-sized raids to planned advances involving corps—becoming in time a valuable auxiliary weapon to commanders of both Allied and German troops. But it was not until the development of a coherent doctrine with reliable delivery systems that gas could be used to fulfill a number of

### ***By 1917, gas was employed in an attack doctrine to paralyze soldiers in their trenches...***

tactical roles or be applied in combined operations. By 1917, gas was employed in an attack doctrine to paralyze soldiers in their trenches, neutralize enemy batteries, disrupt communications from front to rear and laterally, and render attacking units' flanks safe during deep penetrations. Defensively, gas was used to cover withdrawals and retreats, deny areas for troop concentration, and harass enemy soldiers and logistical systems.<sup>25</sup>

In 1918, in order to break the stalemate of static trench warfare, the Germans developed infiltration tactics. What is frequently overlooked today is the fact that chemical weapons played a large role in this offensive innovation. Chemical warfare was one of the key tools by which the Germans were able to negate areas of defence and permit their infantry to move around strong pockets of resistance without having to worry about flank attacks. With infiltration tactics, the farther the attacking groups penetrated into the rear of the defence, the greater the threat to unguarded flanks. The Germans solved this problem by using chemical weapons as a protective device to provide a chemical buffer zone. Mustard gas, in particular, was used tactically, much like a box barrage, to create barriers against the enemy and isolate whole areas of the battlefield.<sup>26</sup> So effective were the mustard-gas tactics that, "even in open warfare," a German history of the war notes, "the troops were soon asking for gas."<sup>27</sup>

Following the failure of the German 1918 offensives, the Allies went

to the attack with the Canadian Corps spearheading the last Allied offensive of the war. Lieutenant-Colonel John English wrote that "in terms of planning, preparation and execution, the offensive was thoroughly modern in nature and involved the use of tanks, indirect fire, tactical air support, chemical weaponry, electronic deception and command, control and

intelligence systems."<sup>28</sup> The role of "chemical weaponry" is often overlooked. The Canadian Corps, like their allies, used chemical weapons offensively (primarily in artillery counter-battery fire plans). Advancing Canadian infantry encountered defensive traps using chemical agents set by the Germans. The retreating Germans had exploded a series of mustard gas shells in dugouts, exactly where the Canadians would be expected to take shelter, and polluted wells with mustard gas to further add to the friction impeding the tempo of the advance. The friction caused by conventional weapons was only exacerbated by gas. Infantry soldiers had to fight with their respirators attached, which led to over-heating and to greatly reduced vision and breathing, thus compounding the effects of normal exhaustion incurred in battle. In the isolation imposed by his mask, the individual soldier was reduced to confusion. For commanders in the rear, gas added to the chaos of modern war by not only obscuring the battlefield but, more importantly, slowing and disrupting communications from the front. The gas hampered signalers and radio operators, and since their success was precarious at the best of times, commanders received late or outdated information when they received anything at all.<sup>29</sup>

After the war, Brigadier-General Fries concluded that chemical warfare, as a friction-inducing weapon, "considering its power, it has no equal." He believed that "physical vigour," the ability and endurance of troops to move and fight, "is one of the greatest assets in any army."

Chemical weapons, he predicted, when used properly and in quantities that will be easily obtainable in future wars, will make the wearing of the mask a continuous affair for all troops within two to five miles of the front line, and in certain places for many miles beyond...[and even] if it never killed a man, the reduction in physical vigour, and, therefore, in efficiency of an army forced at all times to wear masks, would amount to at least 25 percent, equivalent to disabling a quarter of a million men out of an army of a million.<sup>30</sup>

#### DID MANOEUVRE WARFARE THEORISTS TAKE CHEMICAL WARFARE INTO ACCOUNT?

In early post-war Germany, Heinz Guderian, an infantry officer studying future mobile warfare, concluded that the First World War gave rise to four important weapons innovations: the submarine, combat aircraft, the tank, and chemical warfare. He realized that any new theory of warfighting on land would need to take into account the potential of the latter three weapons. His thinking would help revolutionize warfighting.

Of the three new weapons, chemical warfare was seen as the most threatening from an Allied perspective. Following its defeat in the First World War, Marshal Ferdinand Foch, Allied Supreme Commander in 1918, predicted that Germany, “deprived, at least, of its former methods of fighting, and its numerous forces of specially trained soldiers, regularly organized and strongly armed, will be more drawn toward the new systems of attack—that of chemical warfare.”<sup>31</sup> General Wilhelm Ritter von Leeb agreed with Foch that Germany would need chemical weapons in order to assume an offensive posture, believing that

in a tentative future war, [where] we cannot depend upon numerical superiority in personnel and materiel being on our side, defensive will have to support offensive and contribute to its preparation. The role of this defensive, in the case of the absolute superiority of the

enemy, is to wear out his strength... in order to achieve such difficult results against superior forces, no weapon, no means of war should be neglected. All of them have their utility, when they are engaged by one will, according to a unified plan.<sup>32</sup>

Von Leeb, in his 1938 book *Die Abwehr* (“Defence”), states that “in a future war, the war of position can be avoided and the decision can be reached by movement. The French have a word for it: “*manoeuvre*”...[and] this increased mobility, the variety of war means and weapons allow leadership greater combinations of forces and liberty of action...[and] will tend to repel the danger of paralysis of the front.”<sup>33</sup> Von Leeb describes how this early “manoeuvre” approach would be tactically realized:

The commander of mobile shock troops leads his attack according to the general tactical principles. Such an attack is characterized by the quickness with which a gravity is concentrated, by the engagement of strong armored forces, to which the main part of the attack will accrue, rather than by an effort against the flank and in the rear. The attacker can launch local attacks of diversion and entice the defender into splitting up his forces or engaging them too early and in a false direction. Strong air forces support the attack. Other useful aids can be used, such as smoke or gas. The attack will be unified and led deeply into the enemy disposition. With ardor and rapidity, the gap in the defensive system is prolonged in depth, or enlarged towards the flanks; the defensive position is rolled up towards the rear.<sup>34</sup>

Having stated that “no weapon or no means of war should be neglected,” including chemical weapons, von Leeb considers both the offensive and defensive implications of the manoeuvre approach. “Against such an attack, violent and surprising,” von Leeb continues, “defense must be equipped with all necessary neutralizing weapons and means... to that effect, it must erect obstacles against armored attacks on the front, in the flanks, in the gaps, and

utilize mine fields.” To do so, he provides several “essentials of defense,” the first of which is to “use gas and smoke if useful to the purpose.” He explains that the use of infantry small arms fire and “smoke and gas” can combine to “allow a quick disengagement of the defender and his reconsolidation on new lines of resistance.” Chemical weapons are important because, along with obstacles, “gas... clouds hinder the pressure of the enemy.”<sup>35</sup> In von Leeb’s estimation, by “hindering the pressure of the enemy,”<sup>36</sup> chemical weapons were ideal friction-inducing “obstacles” that would enable an inferior force to slow the enemy’s tempo and reduce his pressure on the defences.

As von Leeb was considering the defensive aspects of the war of manoeuvre, Heinz Guderian was considering the offensive power of such an approach. Guderian’s key idea was to restore the mobility and offensive capability of the infantry by having them ride not just forward but into battle on vehicles. He saw tanks as the means of sustaining this mobility.<sup>37</sup> But tanks were not simply vehicles that sustained the fast-moving motorized infantry. They were also, importantly, the means by which the attacking force could negate the use of chemical warfare by the defenders. He formed his own theory of chemical warfare:

Chemical substances... suit the defenders to just about the same degree as the attackers, and so cannot be counted as the exclusive asset of the offensive. For offensive purposes, short-term chemical weapons are used on ground over which our troops will be attacking. Conversely, it suits the defenders to employ persistent agents to contaminate terrain over a length of time—this is particularly useful in the case of a retreat, for it may help our forces disengage.<sup>38</sup>

It is overlooked that Guderian originally proposed his innovative tactics (rapid, powerful thrusts by massed armour in combination with motorized infantry and close air support) in large part to overcome the external friction of chemical weapons and to maintain high operational

tempo on the battlefield. With respect to infantry, he noted that "motorized troops are in fact the only forces that are capable of crossing contaminated ground at speed."<sup>39</sup> And with respect to armour, he believed that "chemical weapons have little effect on tank crews [because] inside the tank, protection against poison gas is offered by masks and over-pressure. The structure of the tank itself gives protection against blistering agents such as mustard gas...[therefore] one of the great advantages of tanks is their imperviousness to chemical weapons."<sup>40</sup>

#### SO WHAT? WHY PREPARE FOR CHEMICAL WARFARE TODAY?

The key to manoeuvre warfare is understanding friction. As Clausewitz noted in 1832, the combat leader must have "an understanding of friction [which] is a large part of that much-admired sense of warfare which a good general is supposed to possess... The good general must know friction in order to overcome it whenever possible, and in order not to expect a standard of achievement in his operations which this very friction makes impossible."<sup>41</sup> In other words, the commander needs to use friction as a weapon against the enemy, and to prevent the enemy from using friction as a weapon against him. The commander whose force can avoid or overcome friction and who can inflict the maximum friction on the adversary's force will be victorious. An effective commander will overcome the problems of friction affecting his force, thereby amplifying his combat power, while at the same time making friction his enemy's problem, thereby degrading his enemy's combat power. For example, the United States Marine Corps manual *Warfighting* confirms that, in manoeuvre warfare, the great requirement is to *fight effectively* despite the existence of friction and, at the same time, to raise the enemy's friction to a level that weakens his ability to fight.<sup>42</sup>

Chemical warfare is friction *par excellence*. Used in the assault, chemical weapons degrade the ability of the defenders to react and resist. The defenders are too occupied in employing

countermeasures (adopting mission-oriented protective posture) and decontaminating themselves to forcefully and effectively resist. Used in the defence, chemical weapons can slow the advance of the enemy and prevent him from pursuing and exploiting a withdrawal.

### ***Chemical warfare is friction par excellence.***

The attacker is forced to avoid contaminated areas, check momentum in order to use countermeasures or leave the scene in order to decontaminate, and reduce his tactical flexibility by the need to employ vehicles protected from chemical weapons. Furthermore, the attacker's troops are slowed by the sheer physical effort of having to fight while cloaked in bulky and cumbersome protective gear.

The inherent friction and the tempo-killing effects of chemical warfare are today firmly embedded in operational doctrine. NATO doctrine for the conduct of operations in a contaminated environment gives commanders two options, beyond mere survival: to move out of the contamination to a clean area or to remain in place in a defensive posture while at the same time removing or reducing the contamination hazard by decontamination.<sup>43</sup> Either of these options involves a loss of operational flexibility and time and represents a transfer of the initiative from the attacker to the defender. In the first case, as von Leeb had foreseen, the defender could deliberately contaminate a key area to blunt or deflect the attacker's thrusting or probing manoeuvre, knowing that the attacker will predictably move in such a way as to avoid the contamination. In the second case, as Guderian had predicted, chemical weapons can be used against fast-moving but unprotected forces, immobilizing them and causing them to stand still and await the effects of decontamination. In either case, the enemy has succeeded in slowing the tempo of operations, turning manoeuvre warfare back into the attrition battle, where the enemy is at less of a disadvantage and, as General Schwarzkopf warned, might even win.

To win, the manoeuvrist leader must be able to overcome the inevitable friction of chemical warfare. Experience and doctrinal thinking during and since the First World War demonstrate that chemical weapons are an effective means to defeat manoeuvre warfare.

Awareness of this fact has induced NATO to conclude that the possibility of NATO forces encountering a hostile offensive chemical weapons capability is "very real, and may be sophisticated."<sup>44</sup> During the Cold War, even with war plans in accordance with "deep battle theory," the Soviets maintained a significant chemical war-fighting capability, with improved delivery systems and rigorous training of their units in operating in a chemical environment. Recent studies reveal that any Soviet invasion of Western Europe would have been preceded by and fought within country-wide chemical clouds.<sup>45</sup>

To counter chemical warfare, NATO doctrine continues to emphasize that "individuals and units will have to be increasingly self-reliant and be confident in making decisions and taking action without outside assistance" because it is not sufficient to survive a chemical weapons attack, rather, "units must be capable of performing their mission in the subsequent environment."<sup>46</sup> To gain such confidence in making decisions and taking action and to perform their assigned missions, leaders and units of the Canadian Army must assume that all manoeuvre warfare operations will be conducted in an environment contaminated by chemical weapons. Accordingly, all training and preparation for combat should be judged effective only if operations can be conducted without loss of tempo resulting from inevitable enemy use of chemical warfare. Only by doing so will we heed the warning of Marshal Foch, if indeed "we do not wish to experience some terrible surprises."



## ABOUT THE AUTHOR...

Second-Lieutenant Mark Gaillard is an infantry officer with the Stormont, Dundas and Glengarry Highlanders in Cornwall, Ontario. He graduated from The Royal Military College of Canada in 2000 with a Master's of Arts degree in War Studies. Mr. Gaillard also holds an LL.M and Bachelor of Social Sciences from the University of Ottawa and LL.B. from the University of Victoria. He also served with the Royal Canadian Mounted Police from 1978 to 1985. He is currently the National Coordinator of the Canadian National Authority for the Chemical Weapons Convention in the Department of Foreign Affairs and International Affairs in Ottawa, Ontario. Mr. Gaillard previously won the 2000 Army Doctrine and Training Bulletin Warfighting Essay Competition with his paper "Their Intelligent Initiative and its Cultivation: A New Leadership Doctrine for Manoeuvre Warfare."

## ENDNOTES

1. Marshal Ferdinand Foch, foreword to Victor Lefebure, *The Riddle of the Rhine-Chemical Strategy in Peace and War*, New York: E. P. Dutton & Company, 1923, p. 8.
2. Quoted in Leonard Cole, *The Eleventh Plague: The Politics of Biological and Chemical Warfare*, New York: W.H. Freeman and Company, 1997.
3. *Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction*, signed at Paris, France on January 13, 1993 and in force on April 29, 1997. Article I, subparagraph 1(c) forbids a State Party "to engage in any military preparation to use chemical weapons." Sub-section 6(c) of the *Chemical Weapons Convention Implementation Act*, S.C. 1995, c. 25, proclaimed on January 1, 2001, states that, in Canada "no person shall... engage in any military preparations to use a chemical weapon."
4. William S. Lind, *Maneuver Warfare Handbook* (Boulder, Colorado: Westview Press, 1985), frontispiece.
5. Richard E. Simpkin, *Race to the Swift-Thoughts on Twenty-First Century Warfare*, London: Brassey's, 1985, reprinted 2000, p. 22.
6. *Ibid.*, p. 73.
7. See AAP-6 (U) *NATO Glossary of Terms and Definitions (English and French)*, 1995, p. 2-C-3.
8. Amnon Barzilai, "Reinventing Warfare," *The Haaretz Daily*, October 22, 2001, available at <http://www.haaretzdaily.com/hasen/objects/pages/PrintArticleEn.jhtml>.
9. The term "chemical environment" is defined as "conditions found in an area resulting from direct or persisting effects of chemical weapons" in AAP-6 (U) *NATO Glossary of Terms and Definitions*, English and French, 1995, p. 2-C-3.
10. The term "chemical defence" is defined as "the methods, plans and procedures involved in establishing and executing defensive measures against attacks utilizing chemical agents." *Ibid.*, p. 2-C-3.
11. Department of National Defence, B-GL-300-002/FP-000 *Land Force Tactical Doctrine*, Ottawa: Department of National Defence, 1997, p. 8-1.
12. Gert G. Harigel, *Chemical and Biological Weapons: Use in Warfare and Impact on Society and Environment*, Washington, D.C.: Carnegie Endowment for International Peace, 2001, p. 1, available at <http://www.ceip.org/files/publications/Harigelreport.asp?p=8>.
13. North Atlantic Treaty Organization, ATP-59 *Doctrine for the NBC Defence of NATO Forces* (Brussels: NATO, 1996), p. 1-1.
14. Harigel, p. 1.
15. United States Marine Corps, *Marine Corps Doctrinal Publication 1-Warfighting*, Washington, D.C.: Secretary of the Navy, 20 June 1997, p. 38.
16. Simpkin, p. 22.
17. *Ibid.*, pp. 106-7.
18. United States Marine Corps, *Marine Corps Doctrinal Publication 1-Warfighting*, p. 40.
19. *Ibid.*, p. 5.
20. Carl von Clausewitz, *On War*, Michael Howard and Peter Paret eds and trans, New York: Alfred A. Knopf, 1993, pp. 138-139.
21. Heinz Guderian, *Achtung-Panzer!*, Christopher Duffy trans, London: Cassell & Company, 1997, reprinted 2000, p. 47.
22. Brigadier-General A. A. Fries, from *Journal of Industrial and Engineering Chemistry* (1920), quoted in Lefebure, pp. 179-180.
23. Tim Cook, *No Place To Run: The Canadian Corps and Gas Warfare in the First World War*, Vancouver: UBC Press, 1999, p. 238.
24. J. E. Edmonds and Lt.-Col. R. Maxwell-Hyslop, *Military Operations, France and Belgium, 1918*, vol. 5, London: MacMillan, 1935-1947, p. 606, as quoted in Edward Spiers, *Chemical Warfare*, Chicago: University of Illinois Press, 1986, p. 33.
25. *Ibid.*, p. 214.
26. *Ibid.*, p. 170.
27. Lefebure, p. 74 (quoting *Die Technik im Weltkriege*).
28. Lieutenant-Colonel John English, *Lament For An Army-The Decline of Canadian Military Professionalism*, Toronto: Irwin Publishing, 1998, p. 18.
29. Cook, p. 192.
30. Brigadier A. A. Fries, from *Journal of Industrial and Engineering Chemistry* (1920), quoted in Lefebure, pp. 179-180.
31. Marshal Ferdinand Foch, foreword to Lefebure, p. 8.
32. Field Marshal General Ritter von Leeb, *Defense* (Harrisburg, Penn: Military Service Publishing Co., 1954, first translated 1943), p. 121.
33. *Ibid.*, p. 120.
34. *Ibid.*, p. 117.
35. *Ibid.*, p. 118.
36. Von Leeb's view on the "hindering" effect of chemical weapons is reflected in the current NATO definition of "chemical warfare" as being useful to "deny or hinder the use of areas, facilities or materiel." See footnote 7.
37. Simpkin, p. 27.
38. Guderian, p. 129.
39. *Ibid.*, p. 129.
40. *Ibid.*, p. 194.
41. Clausewitz, p. 140.
42. United States Marine Corps, *Marine Corps Doctrinal Publication 1-Warfighting*, p. 6.
43. "Chapter 4, Conduct of Operations in a Contaminated Environment," ATP-59 *Doctrine for the NBC Defence of NATO Forces*, p. 4-1.
44. Chapter 5, "Special Considerations," ATP-59 *Doctrine for the NBC Defence of NATO Forces*, p. 5-1.
45. Joachim and Charles K. Mallory, *Chemical Weapons in Soviet Military Doctrine*, Boulder, Co.: Westview Press, 1992.
46. Chapter 5, "Special Considerations," ATP-59 *Doctrine for the NBC Defence of NATO Forces*, p. 5-2.

# Prepare for Battle: Training for 21st Century War

Sergeant Arthur Majoor, CD

*Second Prize 2001 Warfighting Essay Competition*

## INTRODUCTION

To operate in complex post cold war environments, new ways of preparing soldiers and leaders are required. Leaders of the Army of Tomorrow and the Army of the Future are facing immense challenges. Enemy organizations may no longer be armies in the traditional sense. Opponents may take unfamiliar forms such as clan warrior societies<sup>1</sup> or a segmented, polycentric, ideologically integrated network (SPIN),<sup>2</sup> which cannot be dismantled unless a high proportion of its many components can be identified and attacked simultaneously.<sup>3</sup> RMA (revolution in military affairs) theorists like John Arquilla believe that the enemy must be examined in five dimensions—technological, social, narrative, organizational and doctrinal<sup>4</sup>—and no dimension can be emphasized at the expense of others without harming our own efforts. Reaction time for events is very short. Modern weaponry is freely available throughout the world, allowing almost any person or group to gain the ability to strike with devastating firepower.<sup>5</sup> International media such as CNN and the Internet allow images to be transmitted throughout the world, with the potential to rapidly change public opinion either for or against an operation. The Persian Gulf War and the American involvement in Somalia were cut short partly because the public were repelled by images of carnage, such as the “Highway of Death” between Kuwait city and Basra<sup>6</sup> or the dead American servicemen being dragged through the streets after the “Battle of Mogadishu.”<sup>7</sup> The Canadian Army is in the process of adopting manoeuvre doctrine in order to gain the tools required to succeed in these difficult conditions.

## DESIRED OUTCOMES

What are the requirements for leaders in these environments? *Auftragstaktik* requires a flexible mind-

set at all levels for forces to exploit local opportunities. Leaders will need to develop the ability to use intuition in order to rapidly sum up situations and take correct actions that support the desired end-state. Intuition is thought to be “... about sifting through your memory bank of past experiences in order to make decisions. You are, in fact, searching for familiar patterns and are not making decisions in a vacuum.”<sup>8</sup>

The ability to perform pattern analysis and recognition is a key attribute, allowing leaders to discover enemy forces and intent before the enemy can surprise their forces. Leaders at all levels must be able to make proper risk/reward assessments and have the ability to take justified risks in order to accomplish the overall aim. Also, even very junior leaders must be able to take the initiative and rapidly plan and execute actions that support the mission in the event that orders and directions are not received.

## TODAY'S PREPARATION

Current training by drills and templates<sup>9</sup> gives the candidate a deep but narrow foundation to organize data and make decisions. This training methodology is designed to minimize uncertainty, both in the soldier being taught and in the organization, by ensuring that soldiers at all levels are systematically sorting and organizing data according to the same templates. This data works its way up the chain of command, where it becomes integrated into detailed planning matrixes and used to produce plans. The planners, in turn, may be certain that the plans will be executed correctly according to the template. This feedback cycle is an attempt to impose order on the battlefield, efficiently manage resources and ultimately achieve the mission objective.

Unfortunately, this system of command and control that we prepare and train for is not well suited to fast moving

manoeuvre operations. The process of gathering data and incorporating it into detailed planning matrixes and synchronized plans is resource intensive and time consuming. Commanders are liable to make incorrect decisions if their data is wrong or incomplete, thus more time must be devoted to verifying data. One risk of this process is indecision or paralysis while waiting for enough data to base a decision on; another is that an enemy might be able to present corrupt data through hiding, deception and disinformation; yet another is that enemy forces, using some form of manoeuvre doctrine, might be able to overwhelm our command and control systems by changing the situation faster than we can assimilate the new data and incorporate it into plans.

Some early RMA experiments, like the US Army's Force XXI, attempt to speed up the flow of data by superimposing digital communications on a conventional organization. Commanders have greater certainty of the position of forces down to individual soldiers and vehicles, and a rich stream of information on the enemy is provided through the increased use of advanced sensors, unmanned aircraft and other means. Managing and interpreting this torrent of data with sufficient speed is problematic. It is also quite possible that enemy forces will discover means to corrupt data through deception, moving into complex environments which degrade sensors, and, in extreme cases, taking direct action against information nodes (either through cyber attack or, if that is not possible, physical attack against the IT infrastructure). Clearly, increasing and automating the flow of information is not sufficient by itself when attempting to use new doctrines.

## INTUITIVE PREPARATION

Intuition is thought to be a form of pattern matching, in which the human mind rapidly compares the current situation with prior experience. Much of the experience and knowledge we acquire in life is “Tacit knowledge,

the subtle information acquired through observation and experience, that is not clearly understood and therefore cannot be explicitly com-

give the leader sufficient information to improve performance the next time around. S.L.A Marshall devised a mass interview technique, described in *Men*

and attempt to solve problems on their own. The act of problem solving and presenting solutions for feedback by instructors and other syndicate members will stimulate the thought process and provide a background of experiences that can assist in the intuitive decision making process. While syndicate presentations may not be as vivid as implementation of a solution, direction of discussion by the instructor and care in the selection of topics will do much to make the experience interesting and memorable for the student. Care must be taken not to place too much reliance on this form of action learning, since the overall goal is to have leaders equipped with the widest and deepest pool of experience to draw from when engaging in intuitive decision making.

## ***The key is gaining experience through practice.***

municated.”<sup>10</sup> This is the sort of knowledge that allows you to *show* how to do something, even when you are not able to clearly *explain* it. Driving a car, firing a rifle or using a computer program are examples of this sort of knowledge. If you had to describe each action required to perform the task, you would be bogged down in details and only able to carry out the tasks slowly, if at all. Yet, almost anyone can not only drive a car but also perform concurrent activities like drinking a cup of coffee while doing so. Lectures or self-study packages cannot teach this sort of experiential knowledge.

The key is gaining experience through practice. Like a driver, a leader who constantly performs the various functions of leading a unit becomes better at his job and performs many of the functions at an almost unconscious level. However, the hidden danger to this is the constant practise of routine leaves the leader prepared to react to only a limited set of contingencies, in the same way current training of process moulds leaders towards adopting a limited set of “DS solutions.” *Auftragstaktik* demands the ability to perceive opportunities in chaotic situations and exploit them in support of the mission. The need is, therefore, to practice our leaders in varied situations to simulate the process.

The ideal would be “live” exercises on instrumented ranges set in different terrains with an aggressive, “free play” enemy. In such situations, when the enemy reacts to the activities of the leader in non-scripted ways, “canned” solutions will no longer work. Equipment like MILES (multiple integrated laser engagement system) gear will objectively demonstrate whether the decisions made are correct or not, and a combination of after action debriefings, replaying of events recorded on the range, and “360 degree feedback” by all the participants will

*Against Fire*,<sup>11</sup> which could be adopted. Marshall’s technique of assembling all participants of an action and interviewing them en masse is probably one of the best means of conducting an after action briefing ever devised, since the feedback is specific, timely and credible. The use of complex field exercises is very time consuming and resource intensive, so alternative means must be employed to allow leaders to have continuous and wide ranging mental stimulation.

Action learning is a concept that can be used not only during courses but also as part of the annual training cycle. In action learning, participants investigate an organizational problem or opportunity and possibly implement their solution.<sup>12</sup> Problems for our leaders can be explicitly military or non-military in nature: planning and implementing small outings, orienteering competitions, TACOPS (tactical level combat simulation) war games and adventure training can all be used as forms of action training. Leaders should also be given the occasional off-

Another way of increasing the size of the experience pool is to forge closer links between the regular Army and the Militia. Militia soldiers and officers are students, trades people and professionals in their communities, who also undertake military training in their spare time. The many and varied experiences of Militia soldiers make them valuable resources for solving difficult or out-of-the-ordinary problems. Including them formally in decision making, having them participate in “Chinese parliaments,” and including them in informal “bull

## ***Another way of increasing the size of the experience pool is to forge closer links between the regular Army and the Militia.***

the-wall challenge to broaden their horizons. These challenges can be as simple as participating in a team to solve a murder mystery, to elaborate events like *Junkyard Wars*, where teams design and build devices out of scrap parts.<sup>13</sup> Aside from the recreational value, these exercises stimulate the mind to think in new ways, and these new patterns may be profitably applied to solve other problems in the future.

Action learning can also be applied in a classroom setting, by moving away from canned PowerPoint® slide shows and allowing candidates to examine

sessions” provide channels for their outside viewpoints to be included, while they gain insights from Regular Force experience for their problem solving. Regular and Reserve Force leaders who make intelligent use of these resources will have a rich vein of experience to mine while engaging in intuitive decision making.

### **CONCLUSION**

**E**nemy organizations will be constantly changing in order to evade detection and engagement with the professional forces and superior weapons



even small Western contingents have access to and will seek unusual means of engagement to offset the material and numeric advantages of the West.<sup>14</sup> Canadian Forces personnel of all ranks will be thrust into complex and dangerous environments, where decisions with far reaching consequences must be made on the spot. Elements at all levels, from individual soldiers to sub-units and beyond, must be resilient enough to deal with unexpected shocks as opponents use versions of manoeuvre doctrine against us in an effort to destroy our cohesion and break our will to continue.

*Auftragstaktik* demands the intelligent use of intuition to rapidly spot and seize these fleeting opportunities. We must adjust our methods of training in

order for leaders to be able to do so. Preparing our soldiers and leaders for 21st century manoeuvre doctrine will require preparing their minds for the

relationships between the regular Army and the Militia will keep the leaders' minds from slipping into ruts of routine. With breadth and depth of

## **Preparing our soldiers and leaders for 21st century manoeuvre doctrine will require preparing their minds for the demands of that environment.**

demands of that environment. This is hardly a new requirement. The cultivation of "That self reliance which springs from knowledge"<sup>15</sup> was as important to Sir John Moore during the Peninsular Wars as it is today.<sup>16</sup> Constant exposure to action learning, realistic field exercises with 360-degree feedback, and the cultivation of close

experience, leaders will intuitively recognize unusual patterns and quickly formulate plans to achieve the mission objective.



### **ABOUT THE AUTHOR...**

Sergeant Arthur Majoor holds a Business Finance Diploma from Fanshawe College and is currently enrolled in the Microsoft Certified Systems Engineer course. He joined the Canadian Forces in 1981 and served in the regular Army until 1986 before transferring to the Reserve Force. His operational service includes a tour in Cyprus and disaster assistance during the Ice Storm in 1998. Sergeant Majoor is currently employed as the G6 IT Administrator with 31 Canadian Brigade Group Headquarters in London, Ontario.

### **ENDNOTES**

1. Timothy L. Thomas, "The Battle of Grozny: Deadly Classroom for Urban Combat," *Parameters*, Summer 1999, pp. 87-102. The organization of Chechnyan forces was partly built around clan ties.
2. Thomas A. Stewart, "America's Secret Weapon," *Business* 2.0 (December 2001), pg. 61.
3. *Ibid.*, pg. 63. This sidebar, titled "Six Degrees of Mohamed Atta," examines the interrelationships between the 19 hijackers of the September 11 2001 attacks and 15 other people who may be connected to the event, with a diagram generated by a software called InFlow. One of the conclusions of the author is that this particular network would not have suffered significant damage until six nodes with the most important connections—21 percent of the group—was removed. This is an important implication for units attempting to find such an enemy and prevent an incident.
4. *Ibid.*, pp. 62-64.
5. "Special Report: The New Face of War," *Scientific American*, June 2000, pp. 46-65. Several articles outline problems faced in recent conflicts such as the availability of small arms, military activities directed against civilians and the use of child soldiers.
6. David Tucker, "Fighting Barbarians," *Parameters*, Summer 1998, pp. 69-79.
7. *Ibid.*
8. J.M.A. (Marc) Lafortune, "The Decision-Making Process and

Manoeuvre Warfare for the Canadian Army," *The Army Doctrine and Training Bulletin* Vol.3 No.4/Vol.4 No.1 (Winter 2000/Spring 2001), pg. 33. An unattributed quote.

9. A junior leader is taught in the form of lists such as "Seven Battle Drills," "Ten Principles of Leadership," and "Seventeen Steps of Battle Procedure." Marking guides also encourage following a template to achieve a solution, the most extreme being a patrol marking guide ("Section Commander's Marking Guide Aide Memoire for Recce Patrolling"), which has 146 check box items (of which 113 relate to battle procedure and the orders process). To help the leader in the field, aide memoires like B-GL-309-003/FT-Z01 *Platoon and Section Commander's Aide Memoire* are available. This pocket guide for junior leaders has 73 pages (printed on both sides) and is the first and smallest of such aide memoires the leader will use during his/her career.

10. Steven L. McShane, *Canadian Organizational Behavior*, 4th Edition, McGraw-Hill Ryerson, 2001, pg. 39.

11. S.L.A. Marshall, *Men Against Fire: The Problem of Battle Command*, Oklahoma: University of Oklahoma Press, 2000.

12. Steven L. McShane, pg. 51.

13. *Junkyard Wars* is a popular TV show produced by RDF Media and shown (in Canada) on The Learning Channel (TLC).

14. Tom Fennell, "Protest 101," *Maclean's*, April 2, 2001, pp. 34-35. This article outlines how protesters were trained and organized to confront police and security forces during the Summit of the Americas in Quebec City. Of particular interest is the organization of protesters into "affinity groups," and the "affinity groups" into larger "clusters." John Arquilla also discusses how the Zapatista movement in Mexico and the WTO protests in Seattle use unc in the paper "Swarming and the Future of Conflict" [www.rand.org/publications/DB/DB311/DB311.pdf](http://www.rand.org/publications/DB/DB311/DB311.pdf) (viewed 10 Dec 2001).

15. Carola Oman, *Sir John Moore* (London: Hodder & Stoughton, 1953), quoted by Major Douglas Bland in "No Time for Drill," *Canadian Defence Quarterly*, Autumn 1981, pp. 25-28.

16. Arguably, this goes back even farther than that. In the Anabasis, Xenophon takes charge of the "Ten Thousand" after the senior officers have been lured away and killed by treachery, saying "What am I lying here for?... If we fall into the King's hands, there is nothing to prevent us...from suffering all kinds of tortures and being put to death... What city, then, do I expect will produce the general to take the right steps? Am I waiting until I become a little older? I shall never become older if I hand myself over to the enemy today", (From Rex Warner, *The Persian Expedition*, Penguin 1949, reprinted 1965, pg. 99).

# Light Infantry Battalions: Fledgling Swans of a Joint Force

by Lieutenant-Colonel Pat Stogran, CD

*Peacetime innovation is dependent at the intellectual level on an assessment of the security environment that leads to a perceived need for innovation, which, in turn, leads to new concepts of military operations<sup>1</sup>*

## INTRODUCTION

Over the past few years, Western countries have clearly been reminded of the need for air portable rapid reaction forces. The US Army Rangers and the 82nd Airborne Division played a prominent role in the US operations in Granada, Panama, and Haiti. In the Gulf War, their 18 Airborne Corps again played a key pre-emptive role during Operation DESERT SHIELD. The US military remain committed to a rapid reaction capability. This is illustrated by their developmental CV-22 OSPREY, a tilt rotor aircraft capable of rapid deployment of light forces, and the Medium Weight Brigade Combat Teams (BCT) initiative. Although the BCTs may be medium weight armoured forces, they are intended to be air transportable to crises within 72 hours. The German Ministry of Defence is also placing increased emphasis on its rapid reaction capability. Six of their ten fully manned and equipped brigades are earmarked for rapid reaction, and half of those are air transportable as light, airborne, mountain or air mechanized troops.<sup>2</sup> The British Army's commitment to light rapid reaction is nothing short of legendary. An example was their response to the crisis in Sierra Leone when they dispatched 700 lightly equipped soldiers of the Para Regiment, 800 men from 42 and 29 Commando, and an SAS Squadron.<sup>3</sup> Elements of this force conducted a

large-scale non-combatant evacuation operation as well as a daring hostage-rescue mission.

Although the Canadian Forces (CF) have not, as yet, followed the lead of other nations in pursuing a realistic rapid reaction capability, it appears that the situation may be changing. In a speech in Calgary in March of 2000, the Minister of National Defence appeared to support the concept by stressing the requirement for "rapid reaction and global deployability." Although the exact form of such a capability may be the subject of speculation, the Minister went on to emphasize that "the status

***... Light Infantry Battalions should be considered a uniquely joint asset...***

quo is not an option."<sup>4</sup> In discussing the CF crisis planning considerations, a representative of the DCDS's (Deputy Chief of Defence Staff's) office indicated a preference for responding to crises as quickly as possible, in a manner that would have significant impact, and with a pre-conceived strategy for an early exit.<sup>5</sup> Such a concept of operations characterizes light forces. Indeed, if one compares the lessons learned by some of our allies in Kosovo or examines our experience in deploying to East Timor with only limited lead-time, one can extrapolate where the CF is probably destined.

## AIM AND SCOPE

The purpose of this article is to demonstrate that light infantry battalions (LIBs), while they may be the ugly ducklings of the Army of Today and

slated to go the way of the dodo in the Army of Tomorrow, should be given the proper focus and resources as the "fledgling swans" of a joint force. The Canadian Army has three battalions of so-called "light infantry," each consisting of approximately 500 personnel, that were created more as an act of cost saving than strategic vision. Referred to by some as "equipment-deficient battalions," they were originally created as a stop-gap measure to preserve the Army's manpower pool and support overseas deployments. As an Army asset, the LIBs have sat in limbo, awaiting the opportunity to once again man armoured vehicles. They have not been afforded the resources to contribute in a meaningful way to the mechanized brigades that shepherd them nor have they been mandated to achieve their full potential as light forces. This article will suggest that, because light forces

complement the Air Force's ability to project force as a contemporary means of dealing with emerging threats via rapid response, the future of the LIBs should be addressed within the framework of the Joint rather than the Land Force. It will demonstrate how LIBs that are task organized and trained to exploit the full potential of air power as joint manoeuvre battalions<sup>6</sup> (JMBs) could have utility throughout the spectrum of conflict. Rather than a poor cousin to the combined-arms team of the Army, LIBs should be considered a uniquely joint asset that could play a key role in the capability of the future CF.

## THE THEORY

According to Robert Leonhard,<sup>7</sup> "the theory of rapid response is simple: the faster we deploy in response



Light infantry can be delivered in a variety of means. Our doctrine needs to exploit these capabilities. (Courtesy Canadian Parachute Centre)

to a crisis, the less total combat power and the fewer national resources we will need to defeat the threat.” The manoeuvre technique of pre-emption is fundamental to this theory, the significance of which is apparent only if one understands the relevance of the Boyd Cycle<sup>8</sup> in conflict management. The timeliness with which we can organize ourselves, decide and act, with special emphasis on being able to do so repeatedly faster than our potential antagonists, is an important precondition for mission success. The theory of rapid response suggests that, in dealing with a threat, the time required to deploy a mechanized force by sea would negate its advantage in terms of total combat power over a light force deployed rapidly by air. More national resources would be required to defeat a threat force that has been allowed to build momentum and gain success due to a lengthy period of deployment. While the limitation of a light force’s long-term survivability is readily apparent, the definition of success for a rapid reaction force<sup>9</sup> may be simply to buy time by preventing belligerents from seizing and maintaining the initiative, thereby setting the pre-conditions for the decisive actions of a follow-on heavy force. Nevertheless, the

utility of rapid reaction forces in the resolution of conflict will not be realized in the CF because of the Army’s current pre-occupation with equipping and deploying mechanized forces only.

Army planning considerations, given recent operational experiences, are understandably dominated by a concern for force protection. JFC Fuller pointed out that protection is one of three activities of armies in battle, the others being to move and to strike. But these activities are not mutually exclusive. At the tactical level, the ability to move quickly and strike can actually enhance force protection. The contemporary definition of protection is predicated on detection avoidance, hit avoidance given detection, penetration prevention given a hit, and damage mitigation given penetration. The Army paradigm is entrenched in the latter two. However, high-speed mobility protects a force by reducing the chance of being detected or, given detection, making it more difficult to be acquired as a target or engaged with any accuracy. The tactical mobility of helicopters or high-speed lightweight land vehicles would not only serve to protect a light force, they would also allow a light force to pre-empt the hostile actions and defeat an antagonist by expediting our own Boyd Cycle. This is analogous to Leonhard’s description of how the rapid deployment of forces at the strategic level can lead to an economical defeat of a threat. The ability to move and operate in darkness with night vision devices would further enhance the protection of a modern light force through “functional

its potential impact in crisis intervention. However, to optimize the protection of JMBs on operations, special vehicles and equipment would have to be acquired beyond those that have been provided to the LIBs as equipment-deficient mechanized battalions.

#### THE UTILITY OF LIGHT FORCES

Even in high intensity conflict, a JMB that is capable of exploiting the mobility and firepower potential of air forces to the fullest can have a significant impact on the battlefield. A light force that arrives early into any theatre of conflict can seize the initiative. Through dispersed operations and backed by modern surveillance, target acquisition, and digital communication systems, light infantry units can be capable of dominating a superior enemy force through the concentration of tactical and operational fires.<sup>11</sup> The awesome advantage that air power can give to a ground force was clearly demonstrated during the Gulf and Kosovo campaigns. In the case of the latter, it was found that weather and cloud cover can dislocate the ability of aircraft to acquire and designate targets for precision guided munitions (PGMs). This has resulted in an increased interest in PGMs that employ Global Positioning System (GPS) guidance<sup>12</sup>, such as Boeing’s Joint Direct Attack Munition (JDAM). As a result, a JMB equipped with devices that link the capabilities of laser range finders, GPS, and data burst UHF transceivers in tandem will be capable of cueing aircraft onto high payoff targets even beneath cloud cover. Notwithstanding

***A light force that arrives early into any theatre of conflict can seize the initiative.***

dislocation,”<sup>10</sup> especially when faced with asymmetric threats that are not as technically sophisticated. And finally, the firepower that the Air Force can bring to a battlefield—fighter ground attack, gunships or, ultimately—attack helicopters would increase both the level of protection of a light force and

the weather limitation, the Kosovo campaign also aptly demonstrated how air power enables a light ground force to defeat a heavy force, even in the absence of such sophisticated target acquisition devices. After sixty days of the air campaign, NATO was having little success in targeting the concealed

troops and equipment of the Serbs. This took a decisive turn in the latter stage of the war when Serbs had to counter ground incursions by the Kosovo Liberation Army (KLA), thereby exposing themselves to attacks by aircraft.<sup>13</sup> It was, in fact, the threat posed to Serb forces by the synergy of NATO flying air cover for the light forces of the KLA that caused the Serbian authority to acquiesce to the demands of NATO.

In peace support operations (PSO), an air transportable force that is inserted early with specific objectives and a clearly defined exit strategy can have an impact out of proportion to the size of the commitment. Likewise, a pre-emptive deployment of light reinforcements into an existing PSO as a demonstration of resolve could deter belligerents from escalating hostilities. Notwithstanding a JMB's potential to apply coercive force, officers and NCMs could receive special training to act as advisors, observers, liaison or training cadres to legitimate forces working towards internationally sanctioned end-states. In this manner, Canada's contribution to United Nations missions could act as a significant force multiplier. A light force could be useful in support of a major air disaster (MAJAD) operation or the Disaster Assistance Response Team (DART), particularly if the DART had to deploy into a potentially hostile environment. This capability would be enhanced if elements of the light force had a higher level of training in medical care. Advanced training could be mandated

for light forces because LIBs, unlike their mechanized counterparts that are encumbered by the massive training and maintenance demands of their light armoured vehicles, are in a position to develop more sophisticated and refined skill sets to meet more complex tasks. Finally, it is possible that member states of the UN could be called upon, once again, to deliver humanitarian aid by parachute. It is equally conceivable that ground troops could be required to distribute the aid, defend refugee concentrations, establish camps or enforce order. Developments such as precision guided aerial delivery systems and CT-6 static line deployed steerable parachutes increase the flexibility of light forces in complex operations other than war (OOTW) and reinforces the Air Force's vital role in responding to emerging threats.

Non-combatant evacuation operations (NEO), such as those mounted (but not executed) by the CF without coalition or alliance support on numerous occasions,<sup>14</sup> are very much the domain of light forces. Today the CF, like many military forces of the West, maintains a special force that can conduct specific high-risk tasks during a NEO. Other nations, however, have earmarked additional light forces for the actual conduct of NEOs to carry out such tasks as securing points of entry and exit, establishing cordons, executing supporting combat actions, and protecting, processing, and transporting evacuees. JMBs should

train and be task-organized for rapid deployment on such missions. Even in so-called "permissive scenarios" the host nation government will likely be facing a crisis where it cannot offer a NEO force any assurances of security, so light forces might be required to secure airfields or ports to permit freedom of manoeuvre for Air Force or Navy resources. One obvious means of achieving

this in particularly dangerous situations is by dispatching paratroops to secure the point of entry and extraction. Once again, the capability to deploy troops by parachute is seen as a joint capability rather than strictly Army, and one that could prove essential to the success of a NEO mission that the government could assign to the CF.

Canadian defence policy compels the Army to pursue a multi-purpose capability, to which the JMB concept is well suited. It has already been suggested that LIBs have the potential to train to a higher standard, not only in traditional infantry tasks but also in a wider variety of skills. This would improve the flexibility of JMBs and hence their multi-purpose potential. JMBs would satisfy the requirement for a rapid reaction capability as a joint asset as well as make an important contribution to combined arms teams as infantry. Particularly for overseas deployments that require mechanized forces, JMBs could be task organized to provide "armoured assaulters" to armoured regiments that already possess the skill sets necessary to crew and manoeuvre armoured vehicles. Training would alleviate any command and control concerns in the same manner that it does for square combat teams.<sup>15</sup> In the future, the training demands of the LAV III will make such task organizing far more practical and cost-effective than converting LIBs into mechanized infantry units.

#### A RAPID REACTION CAPABILITY AND THE CANADIAN FORCES

It is beyond the scope of this paper to describe in detail how a rapid reaction force should be constituted within the CF. Suffice to say that the apparent attitude towards the LIBs is either a lack of vision regarding the impending imperative of rapid reaction or an indictment of our ability to think "joint." It is unrealistic to expect that we could ever be capable of rapidly deploying LAV units in the same manner as the US Army's BCT. This would require the CF to adopt the practice of forward-deploying infantry units like the United States Marine Corps (USMC) does. It is unlikely that the CF could generate sufficient



**Exploiting mobility.** Light infantry can achieve power projection through a variety of platforms (Courtesy Canadian Parachute Centre).

resources to achieve such a maritime-based rapid reaction capability. Rapid reaction could only be achieved in the Canadian context using Air Force assets, and the existing fleets of Airbus, CC 130 Hercules, CH-146 Griffon, and the F-18 Hornet offer the land component of joint rapid reaction force significant strategic and tactical mobility as well as firepower. Projects aimed at improving the Griffon's lift, surveillance, target acquisition and fire support capability will greatly enhance the operational effectiveness of a rapidly deployable light force. From the Land perspective, the rapid reaction capability is addressed by the DCDS's Immediate Reaction Force (Land) (IRF(L)). The IRF(L) is normally a task assigned to an LIB that is mandated to provide a high readiness company at three days notice to move and the remainder of the battalion group at ten—an extraordinarily high state of readiness that is paid little more than lip-service. This tasking is traditionally rotated on an annual basis between the LIBs of the three infantry regiments, which, as the Defence Planning Guidance (DPG) states, are to be manned to 100 percent. It is not a realistic expectation, based purely on poor retention within and recruiting to the Land Force and the lack of funds available for cost moves, that successive battalions on an annual basis can be brought up to full strength. Once mounted, the IRF(L) remains OPCOM to the mechanized brigade. However, despite the fact that the task is afforded the same priority in the DPG as an Op PALLADIUM, as “just another unit in the Brigade,” the IRF(L) is required to bear a proportional share of the annual tasking burden. This seriously degrades its ability to maintain a high state of combat readiness.

To meet its commitment to the DCDS's requirement for a joint rapid reaction capability within the framework of its vision for a “tactically decisive medium-weight force,” the Army should be compelled to retain suitably trained and equipped LIBs. The question arises, how much can the Land Force afford to commit to a rapid reaction capability, especially if we accept that special equipment and skill sets are required to make such a force truly effective? The obvious solution of having a single JMB

mandated for rapid reaction is complicated by the uniquely Canadian imperative to offer the two English and one French speaking infantry regiments an equal opportunity for this role. This

## ***Rapid reaction could only be achieved in the Canadian context using Air Force assets...***

solution would likely mean that each regiment would provide a company to a single JMB. Unfortunately, such an arrangement bears too much resemblance to the Airborne Regiment, which is likely still too controversial to be considered an option. A more practical approach would be to task-organize one of the LIBs for at least three years, in accordance with the Army Training and Operations Framework, as a JMB to be trained, equipped, and manned to exploit the full potential of the Air Force for rapid reaction to crises. Once mounted, the JMB would be cut to under OPCOM of the Joint Operations Group and be expected to conduct specialized training as the land component on joint exercises. A useful model for JMBs would be the Special Operations Capable (SOC) units of the USMC that, as regular infantry units given special training and equipment on a fifteen-month rotation, have been able to accomplish their normal duties as infantry battalions as well as “extraordinary missions.”<sup>16</sup> Such an approach would facilitate the maintenance of a highly capable reaction force and, at the same time, position two LIBs for a six-year period to support armoured regiments as “armoured assaulters” for PALLADIUM rotations and similar deployments.

### **THE DETRACTORS**

There are many in the Army who do not support the assertion that the Canadian Army requires a dedicated light force for rapid reaction. Some will argue that any infantry battalion can conduct light operations in a rapid reaction scenario. It is true that any unit in the Army could abandon their armoured vehicles and operate dismounted. While it may be argued that this is the extent of the capability of

current LIBs—to operate as a dismounted battalion—this is only because they have been afforded neither the mandate nor the resources to achieve their full potential. However, the extant

requirement for the IRF(L)-designated LIB to maintain a state of readiness of three days notice to move into a crisis situation demands that it be more than combat capable: it must be combat ready. If we are to be responsible when deploying our troops into a hostile environment, we must ensure that they are continually exercising their collective and individual battle craft in order to avoid skill fade. It is inconceivable that a mechanized unit, with the maintenance and training debt associated with its fleet of armoured vehicles, could train to the same level as a JMB and operate with the same degree of flexibility as the land component in a hastily assembled joint task force.

Others will respond to this article with the argument that the scenarios offered herein are too unrealistic. That same hypothetical counter-argument could have been made at the end of the Cold War had it been suggested that we would deploy to scenarios such as:

- a. Rwanda, an observer mission under Chapter 6 of the UN Charter, where troops were expected to “observe and report” on the genocide of almost a million people; or
- b. the Former Republic of Yugoslavia, a Chapter 6 mission that, at the same time, had enclaves that were to be defended in accordance with the provisions of Chapter 7.

Still others will argue that Canada is too risk averse to actually deploy a light force; however, it can be expected that current perceptions will change in the face of a crisis. The “CNN Factor” will have a significant impact on the will of Canadian leadership at all levels to execute operations with a perceived high risk. But if we wish to quantify

how much risk the CF might be prepared to accept, we should examine the early days of UN and NATO operations in Bosnia and compare the configuration of Nordic, US and British contributions to our own. It could be argued that the Canadian Army took considerable risk, perhaps unknowingly, by deploying mechanized

be able to make a claim on in the event of a crisis. The Army publication *The Future Security Environment* suggests that planning for the future CF should be capability rather than threat based; so, as a professional force, we should not allow our current perceptions to limit our capability in the future. If defence policy shifts toward rapid

therefore be task organized and trained as a light force to work with the Air Force to optimize this capability within CF resource constraints. Rapidly deployed light forces have utility throughout the spectrum of conflict, from conventional operations to OOTW. The flexibility that is afforded by the higher standard of training possible by light forces lends itself to the multi-purpose nature of the CF. While it appears that there is little support within the Army for light forces, the requirement to develop a rapid reaction capability in the CF may dictate otherwise. One of the LIBs should be mandated as the IRF(L) for at least three years and manned, trained, and equipped to exploit the full potential that air power offers the rapid reaction capability. In the final analysis, while the LIBs may be treated as the ugly ducklings of the "Army of Today," as JMBs they could grow to be swans in the CF's "Joint Force of Tomorrow."



## ***Rapidly deployed light forces have utility throughout the spectrum of conflict...***

forces that were deficient in the direct and indirect firepower resources traditionally associated with such a combined arms teams to the Former Republic of Yugoslavia where the threat had considerable armoured forces. It may also be that, following experiences such as Rwanda and Srebrenica, a collective conscience exists that will one day compel us to respond rapidly to a threat to human security somewhere in the world and the argument of risk is moot. We are an insurance policy that our country must

reaction forces, the integration of a LIB with the Air force as a JMB and the allocation of sufficient resources to ensure that the are combat ready should be fundamental to that capability.

### **CONCLUSION**

Other NATO armies are placing increased emphasis on an air transportable rapid reaction capability, and it appears that Canadian defence policy may follow suit. LIBs should

### **ABOUT THE AUTHOR...**

Lieutenant-Colonel Stogran graduated from The Royal Military College of Canada in 1980 with a degree in Electrical Engineering. He has served in various positions with the 1st and 3rd Battalions of Princess Patricia's Canadian Light Infantry. He served as a UN Military Observer in Bosnia for one year, where, as the Team Leader in the enclave of Gorazde, was awarded a Mention-in-Dispatches for courage under fire during the Serbian offensive of April 1994. Lieutenant-Colonel Stogran is a graduate of Division I of the Technical Staff Course at the Royal Military College of Sciences in Shrivenham, England. He was a staff officer with the Light Armoured Vehicle Project Office in Ottawa and participated in drafting the formal Statement of Requirement that led to the acquisition of the Coyote and LAV III. Lieutenant-Colonel Stogran was also a member of the Directing Staff at the Department of Applied Military Sciences at The Royal Military College, as an instructor of military technologies and project management on the Land Force Technical Staff Program. He was also an instructor at the Australian Army Land Warfare Centre. Lieutenant-Colonel Stogran is licensed as a Professional Engineer in the province of Ontario and is currently Commanding Officer of the 3 PPCLI Battalion Group in Afghanistan.

### **ENDNOTES**

1. Stephen Peter Rosen, *Winning the Next War: Innovation and the Modern Military*, Ithaca New York: Cornell University Press, 1991, p. 96.
2. *Jane's Defence Weekly*, 7 July 1999, pp. 25-31.
3. John Parker, *Commandos: The Inside Story of Britain's Most Elite Fighting Force*, London: Headline Book Publishing, 2000, pp 269-272.
4. Speech by the Honourable Art Eggleton, Minister of National Defence, to the University of Calgary, March 10, 2000.
5. Colonel W Natynczyk, COS J3, address to the Commanding Officers' Course, CLFCSC Kingston, June 2000.
6. For the purposes of this paper, the term "Joint Manoeuvre Battalion" will refer to LIBs that are task organized and trained to support rapid reaction-type missions.
7. Robert R. Leonhard, *Fighting by Minutes: Time and the Art of War*, Westport, Ct.: Praeger, 1994.
8. Sometimes called the "OODA Loop," an acronym that describes the activities of Observe, Orient, Decide, and Act. Some theorists suggest that the ability to cycle through the Boyd Cycle of decision-making faster than an OPFOR to exploit opportunities to attack critical vulnerabilities in a timely manner is the essence of manoeuvre warfare.
9. Sometimes referred to in NATO terminology as initial entry forces (IEF).
10. Robert Leonhard, *The Art of Maneuver: Maneuver-Warfare Theory and AirLand Battle*, Novato, Calif.: Presidio Press, 1991.
11. USMC Study, HUNTER WARRIOR.
12. *Jane's Defence Weekly*, 7 July 1999, page 23.
13. *Jane's Defence Weekly*, 16 June 1999, page 5.
14. Sean Maloney, "Never Say Never: Non-Alliance Operations in the Canadian Context," *The Army Doctrine and Training Bulletin*, Vol. 2 No. 2 (May 99). The article describes several operations that were mounted with what amounts to "light Infantry" (lacking support of AFVs) but not executed.
15. A "square combat team" is a combined arms grouping of a tank squadron and infantry company, both commanded by a major. Training in infantry-tank cooperation establishes an understanding between the commanders and makes the square combat team a particularly potent element.
16. Tom Clancy, *Marines: A Guided Tour of a Marine Expeditionary Unit*, New York: Berkley Books, 1996, p. 213.

# BOOK REVIEWS

## "War Is an Art"

Review Essay by Donald E. Graves

**T***ruppenführung* (Unit Command), the German army manual containing basic principles for "command, field service, and joint operations in war," was first issued in 1933 and remained in service until 1945.<sup>1</sup> It is, therefore, the major source for *Wehrmacht* doctrine during the Second World War, and it has received unstinting praise from both military professionals and historians. Williamson Murray, a leading scholar of the German Army, believes *Truppenführung* to be "one of the most thoughtful examinations of the conduct of operations and leadership ever written," and other commentators have been no less laudatory.<sup>2</sup> The United States Army early recognized its excellence and based large portions of the 1940, 1944, and 1949 editions of FM 100-5: Operations directly on *Truppenführung*; it has also had marked influence on the 1984, 1986, and 1993 editions of the same publication.<sup>3</sup> The *Bundeswehr* reintroduced a modified version in 1955, and it has inspired doctrine in that army ever since.<sup>4</sup> Given its reputation and importance, and the fact that it was first translated in 1940, one would think that a definitive English-language version of this classic manual would have appeared long before now, but this has not been the case. Most English-speaking soldiers or scholars who have consulted *Truppenführung* in the last four decades (including the reviewer) have been forced to make to do with a photocopy of an inaccurate wartime translation of its first part only.<sup>5</sup> As a result, it is not surprising that *Truppenführung* has been a book more often quoted than read.

Thanks to Bruce Condell and David T. Zabecki, this significant manual is now available in a well-

translated English edition, which is enhanced by the inclusion of additional material. The foreword by James Corum and the editors' own introduction provide the context necessary to comprehend the historical lineage of *Truppenführung*, both before and after the Second World War. The main text is supplemented by footnotes that explain or elucidate important German terms—e.g., *Reibung* (friction), *Verband* vs. *Einheit* (formation vs. unit), and *Entfaltung* vs. *Entwicklung* (developed vs. developing)—that are often not fully comprehended, or are confused or misused by the English reader. Valuable insights into the contents of *Truppenführung* and the actual emphasis given by the *Wehrmacht* to its various components are contained in notes quoted from the reports of two American officers, Captains Harlan N. Hartness and Albert C. Wedemeyer, who were exchange students at the German *Kriegsakademie* in the 1930s. Last, but certainly not least, Condell and Zabecki have included a fascinating evaluation of FM 100-5 undertaken in 1953 by a committee of senior German officers chaired by Franz Halder, Chief of the General Staff from 1938 to 1942, whose comments are tactful (perhaps too tactful) but incisive.

*Truppenführung* has an interesting history. Following the German Army's defeat in the First World War, General Hans von Seeckt, Head of the postwar *Reichswehr*, instituted a project to study and analyze the military developments of that conflict. One of the results of this wide-ranging intellectual exercise was the introduction, in 1921-1923, of a new manual of tactical doctrine, *Heeresdienstvorschrift 467, Führung und Gefecht der verbundenen Waffen*—Command and Combat of the Combined Arms, usually (and thankfully)



*On the German Art of War. Truppenführung.* Bruce Condell and David T. Zabecki, editors and translators. Lynne Rienner Publishers, Boulder, Colorado, 2001. ISBN 1-55587-996-9 288 pp.; appendices; index. US \$57.00

abbreviated as the "*FuG*." Although Von Seeckt signed the manual, and he may have drafted portions of it, it was actually the work of many officers. The *FuG* was notable because, in a time when the doctrine of most Western armies was influenced by their recent experience of positional warfare, it stressed offensive operations carried out by mobile combined arms forces. It also emphasized a traditional German military principle that an officer must try, at all times, to carry out the mission concept of his superiors, even to the point of appearing to disobey orders if the situation changed. Known in modern times (but not quite correctly) as *Auftragstaktik*, this principle can be traced back to Scharnhorst's reforms of the Prussian Army in the first decade of the 19th century, but the *FuG* greatly expanded it to include all ranks, from general to private.<sup>6</sup> The *FuG* served the German Army well, but the rapid progress of aviation, mechanization, and radio



communication in the late 1920's began to render it increasingly obsolescent; in 1931, it was decided to draft a replacement manual.

This work was carried out under the direction of *Oberst* Werner Freiherr von Fritsch, Head of the Operations Branch of the *Truppenamt*, as the general staff was known from 1919 to 1933. Fritsch supervised the project, but much of the actual writing was done in 1931-1933 by two general staff officers, *Oberst* Ludwig Beck and *Oberstleutnant* Carl-Heinrich von Stülpnagel.<sup>7</sup> Beck was the primary author, and, as his biographer commented, he possessed a talent rarely found in military authors: Beck could actually write "prose of some elegance."<sup>8</sup> Part I, concerned with basic tactical principles, was released in late 1933, and Part II, which dealt with armoured warfare, aviation, air defence, communications, and specialized subjects, appeared the following year. *Truppenführung* was intended to be the capstone manual of the German Army, and it was supplemented by a series of lower level manuals written for specific arms and specialized units. It proved of great service during the massive expansion of the army during the 1930's, but, by 1939, there was a general consensus that the technical sections were dated. A project to compile a replacement was initiated but, overtaken by the war, never completed. Ironically, Beck and von Stülpnagel, the two officers most responsible for *Truppenführung*, were also active in the army's resistance to Hitler and the Nazi leadership, an activity that cost them their lives.<sup>9</sup>

One of the elements that set *Truppenführung* apart from its predecessor was its introductory section, written by Beck, which summarized the German Army's first principles in fifteen thoughtful but succinct paragraphs. Paragraphs one to three set the tone for the whole manual:

1. War is an art, a free and creative activity founded on scientific principles. It makes the very highest demands on the human personality.
2. The conduct of war is subject to continual development. New weapons dictate ever-changing

forms. Their appearance must be anticipated and their influence evaluated. Then they must be placed into service quickly.

3. Combat situations are of an unlimited variety. They change frequently and suddenly and can seldom be assessed in advance. Incalculable elements often have a decisive influence. One's own will is pitted against the independent will of the enemy. Friction and errors are daily occurrences.<sup>10</sup>

Following the introductory section, *Truppenführung's* 1049 paragraphs in 23 parts provide—in the editors' dead accurate words—not a "cookbook on how to win battles," but "a set of intellectual tools to be applied to complex and ever-unique war-fighting situations."<sup>11</sup> *Truppenführung* is not a prescriptive manual. It does not attempt to list every possible situation that might be encountered and then provide the correct response to that situation—far from it, it even warns against a too slavish worship of written doctrine:

4. Lessons in the conduct of war cannot be exhaustively compiled in the form of regulations. The principles enunciated must be applied in accordance with the situation.

Simple actions, logically carried out, will lead most surely to the objective.

The principles of command are succinctly but clearly enunciated:

27. Great success requires boldness and daring, but good judgement must take precedence.
28. One can never be strong enough at the decisive point. The commander who tries to be secure everywhere, or who wastes his forces on secondary missions, acts contrary to this basic rule.

The worst sin a commander can commit is to do nothing—any plan, even a bad one, is better than no plan at all. As Captain Hartness reported, his instructors at the *Kriegsakademie* in the 1930's emphasized that, in combat:

The solution arrived at may not be the perfect or the best one, but if it is a workable solution, capable of execution with the means at hand, it is a solution which will stand the test of combat and such is given equal credit with other solutions, which in more or less detail may appear better. The decision, the reaching of a workable solution is the objective. Seldom in war is the paper perfect solution achieved.<sup>12</sup>

His fellow student Captain Wedemeyer agreed: "Better a faulty plan or decision permeated with boldness, daring and decisiveness, than a perfect plan meshed in uncertainty."<sup>13</sup> It is interesting that the only paragraph emphasized in the original text of *Truppenführung* contained these words:

15. The first criterion in war remains decisive action. Everyone, from the highest commander down to the youngest soldier, must constantly be aware that inaction and neglect incriminate him more severely than any error in the choice of means.

Decisive action on the part of all soldiers involved in a mission requires that each has a share in its success or failure—the essence of *Auftragstaktik*. Although the editors note that the dreaded *A-word* is never used in *Truppenführung*, it is thoroughly imbued with the concept. Consider, for examples, the following:

6. The command of an army and its subordinate units requires leaders capable of judgement, with clear vision and foresight, and the ability to make independent and decisive decisions and carry them out unwaveringly and positively. Such leaders must be impervious to the changes in the fortunes of war and possess full awareness of the high degree of responsibility placed on their shoulders.
36. The mission and the situation define the course of action. The mission dictates the objective. The responsible commander must not lose sight of it. A mission that consists of multiple tasks can easily distract attention from the main objective.

73. An order should contain all that a subordinate needs to know to be able to execute his mission—and nothing more. Accordingly, the order must be short, clear, specific, and complete. It must be understandable by the recipient and conform to his situation. The commander who issues the order must always put himself in the position of the recipient.

As the Halder committee summed it up, uniformity of doctrine "is a prerequisite of independent action within the overall operational framework," and if that uniformity is present and a subordinate commander has "been given freedom to act in the spirit of his mission, then any additional instructions hamper his initiative."<sup>14</sup>

When turning to the sections on attack and defence, it is interesting to note that, despite the emphasis traditionally accorded to the former in German military thought, they both receive almost exactly the same amount of attention (112 paragraphs for attack as opposed to 111 for defence) in *Truppenführung*. Despite this equal treatment, we learn from Captain Wedemeyer that, during his two years at the *Kriegsakademie*, his class received less than ten defensive tactical problems out of a total of more than seventy problems.<sup>15</sup> However, that may have been the prewar emphasis because, in 1943-1945, the *Wehrmacht* clearly demonstrated that its defensive doctrine was sound, and the Halder committee cautioned the United States Army in 1953 about elevating the offensive to "the level of a dogma," emphasizing "attack at any price" since an officer uncertain about his next move should not be misled into attacking because it is "more soldierly."<sup>16</sup>

Although the editors point out that *Truppenführung* has its weaknesses—notably in its treatment of logistics,

combat intelligence, and mobile artillery—they are more than balanced by its positive aspects. Indeed, so highly is *Truppenführung* regarded that, since it was first issued, it has become many things to many people, particularly to those involved in the doctrinal controversies of the last two decades. Among the attributes accorded to *Truppenführung* is that it is the birthplace of modern armoured warfare, although this claim is somewhat tenuous.<sup>17</sup> It has been more commonly regarded as Holy Writ for the German theory of operational warfare; as one of the best expressions of both *manoeuvre warfare* and *mission command*; and as a model of the *systems approach* to the formulation of doctrine.

*Truppenführung* may be all these things, and more, but what it certainly is, is a clear and elegant expression of a coherent, consistent, and workable offensive and defensive tactical doctrine—simply and clearly expressed. And there is no doubt that this doctrine was followed, because one can immediately recognize paragraphs 552 to 558 ("Fighting in Built-Up Areas") as the basis for the defence of Ortona in late 1943, while the principles described in paragraphs 503 to 538 ("Disengagement and Withdrawal" and "Delaying Action") are clearly the source for the tactics used against First Canadian Army by General Kurt Student in Holland in the autumn of 1944. The section on "The Defensive" ("427. The defensive is based primarily on firepower. The defender, therefore, must try to produce the maximum fire effect") was successfully followed by General Heinrich von Lüttwitz's 47th Panzer Corps against 4th Canadian Armoured Division at the Hochwald Gap in February 1945.<sup>18</sup>

The development and choice of doctrine is currently a matter of much debate in the Canadian Forces and the pages of this journal have carried some excellent and lively expressions of the opposing points of view.<sup>19</sup> It is not likely

that the firing will die away in the near future, but we have been very wisely cautioned that the rigorous historical analysis of past military operations is far superior to theoretical discussions about doctrine since such analyses "are doctrine taught by example."<sup>20</sup> Thanks to the efforts of Bruce Condell and David T. Zabecki, the English-speaking reader now has free access to one of the most important tools for the analysis of military operations in Europe during the Second World War.

*On the German Art of War* is an excellent example of how a foreign military manual can be translated and presented, and the appearance of this fine new English edition is a matter of some celebration. I believe *Truppenführung* is indispensable reading both for students of doctrine and historians studying German military performance during the Second World War. I would go farther and recommend it to all soldiers who wish to know more about the basic principles of their profession. My only critical comment concerns the high cover price (nearly \$100 Cdn), which will place it out of the reach of many military personnel; it is to be hoped that a more reasonably priced soft-cover edition will be issued in the future.

Donald E. Graves is a military historian specializing in operational and tactical warfare. He is the author and editor of several critically acclaimed books—including *Fighting for Canada: Seven Battles, 1758-1945*. He is currently Managing Director of Ensign Heritage Group, a commercial firm that provides consulting services relating to military history to Canadian and American government departments (including the Department of National Defence), museums, and film companies. He lives near Ottawa, Ontario.



## ENDNOTES

The reviewer wishes to acknowledge the assistance rendered to him in the preparation of this review by Oberstleutnant Dr. Winfried Heinemann of the Militärgeschichtliches Forschungsamt of the Bundeswehr in Potsdam.

1. The order promulgating the release of *Truppenführung* dated 17 October 1933 is contained on p. 16 of *The German Art of War*.

2. Williamson Murray, "Leading the Troops: A German Manual of 1933," *Marine Corps Gazette* (September 1999), p. 95. James Corum, student of the interwar German Army, in his introduction to this edition of *Truppenführung*, p. x., calls it "one of the most important expressions of doctrine in military history." Martin van Creveld devoted three chapters of his seminal work, *Fighting Power* (Westport, 1982) to an analysis of the manual's principles. Shimon Naveh, the Israeli scholar of the operational level of war, praises *Truppenführung* for a "balanced approach to offensive and defensive" that

regards both as "essential and complementary forms of operational maneuver," Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory* (Westport, 1997), p. 116. Lieutenant-Colonel Ian Hope of the Canadian Army believes that *Truppenführung*, "and not the opportunistic occurrences of *Blitzkrieg*, was the key to German tactical success" during the Second World War. Ian Hope, "Misunderstanding Mars and Minerva: The Canadian Army's Failure to Define an Operational Doctrine," *Army Doctrine and Training Bulletin*, 4, 4 (Winter 2001-2002), p. 23.

3. Editors' introduction to present edition, p. 11.

4. Information from *Oberstleutnant* Dr. Winfried Heinemann, *Militärgeschichtliches Forschungsamt*, Berlin.

5. The United States Army's translation of Part I of *Truppenführung*, filed as "Report No. 14,507" in Record Group 165 of National Archives in Washington was reproduced in photocopy form and distributed by Digital Productions of Lacrosse, Wisconsin, sometime in the late 1970's or early 1980's. The translation of Part II of *Truppenführung*, however, was not even declassified until 2000, and very few researchers have seen it.

6. On the origins of the mission concept in the German Army, see Charles E. White, *The Enlightened Soldier: Scharnhorst and the Militärische Gesellschaft in Berlin, 1801-1805* (Westport, 1989), p. 139.

7. There is a minor error in the editors' introduction to *Truppenführung* in that they have confused Carl-Heinrich von Stülpnagel with his cousin, Otto von Stülpnagel. This is a common error, not only because of the surname, but because both men served as military governors of France during the Second World War.

8. Robert O'Neill, "Fritsch, Beck and the Führer," in Corelli Barnett, ed., *Hitler's Generals* (London, 1989), p. 7.

9. Ludwig Beck, as *Generalleutnant*, was appointed chief of the army general staff in 1933 and served in that appointment until 1938 when, unable to serve under Hitler and the Nazi leadership, he resigned in disgust. He was involved in the anti-Nazi conspiracy that culminated in an assassination attempt on Hitler's life in July 1944. If Hitler had died, Beck was to become the new head of the German state; but when it failed, he committed suicide. On Beck, see Robert O'Neill, "Fritsch, Beck and the Führer," in Corelli Barnett, ed., *Hitler's Generals* (London, 1989), pp. 19-41.

Carl-Heinrich von Stülpnagel was promoted steadily and commanded a corps during the 1940 French campaign and an army in Russia. In February 1942, as *General der Infanterie*, he was appointed military governor of France and his headquarters in Paris were a centre of anti-Nazi plotting within the army. When the July plot failed, von Stülpnagel was arrested and executed. On von Stülpnagel, see Heinrich Bucheler, *Carl-Heinrich von Stülpnagel, Soldat-Philosoph-Verschwörer*, (Berlin, 1989).

Von Fritsch, while not involved in anti-Nazi resistance, fared no better at the hands of the political leaders of the Third Reich. In 1934 von Fritsch, as *General der Artillerie*, was appointed commander-in-chief of the army but, over the next four years, came to detest Hitler and the senior Nazi leaders whom he believed would involve Germany in a war it could not win. After completely false charges of sexual misconduct were brought against him, von Fritsch resigned his position and requested a court of inquiry to clear his name. He was completely exonerated but not re-instated. Fritsch served in the Polish campaign and was killed by a sniper after he appears to have deliberately sought death in combat. On Fritsch, see Williamson Murray, "Werner Freiherr von Fritsch. Der tragische General" in Ronald Smelzer and Enrico Syring, eds., *Die Militärelite des Dritten Reiches* (Ulstein, 1995), pp. 153-170.

10. Although it is blatantly unfair to do so, because the Canadian Army is a product of a different culture and time, it is just too tempting to compare the introduction of *Truppenführung* with those of B-GL-300-002/FP-000: *Land Force Tactical Doctrine*, the Canadian manual it most closely resembles. The opening paragraph of the Canadian work first directs the reader to two other manuals and then informs him or her that the current manual is "to provide the basis for the study of tactical doctrine." That being said, B-GL-300-002/FP-000 gets down to business by discussing "The Spectrum of Conflict:"

Relations between different peoples can exist in either a condition of peace or conflict. Peace exists between groups of people or states when there is an absence of violence or of the threat of violence. Conflict exists when violence is either manifested or threatened. The essence of conflict is a violent clash between two hostile, independent, and irreconcilable wills, each trying to impose itself on the other. Thus the object of conflict is to impose one's will upon the enemy. The means

to that end is the coordinated employment of the various instruments of national power including diplomatic, economic and political efforts as well as the application of violence or the threat of violence by military force.

One envies the *Wehrmacht* in that their major concern was preparing for battle, not for a "Spectrum of Conflict" that includes such activities as "participating in nation building at home and abroad" (paragraph 4, page 1-3 of *Land Force Tactical Doctrine 2*).

Even more convoluted is paragraph 9 on page 1-7, which explains the rationale behind the current Canadian doctrine:

9. General. The Canadian Army, after almost a decade of debate, has adopted manoeuvre warfare as doctrine. For some, this change may mean a new way to look at how the army fights. For others, this new doctrine may involve only the minor re-thinking of how they perceive warfare in its varied dimensions. Most importantly, everyone will have to appreciate that this new doctrine means change. How much change will depend upon the individual and the circumstance.

What do these paragraphs from the Canadian manual actually say? Certainly, they remind the reviewer of the hoary old academic maxim that, in writing, one should always "eschew obfuscation." In other words, call a spade a shovel, for that is what it is.

"War is an art, a free and creative activity founded on scientific principles" -- simple, elegant, and true. Think about it.

11. Editors' introduction, p. 9.

12. Harlan H. Hartness, "Report on German General Staff School, Staff Methods, and Tactical Doctrine," 3 May 1937, United States National Archives, RG 165, Box 113, quoted in the editors' introduction, p. 9.

13. Editor's introduction, p. 10

14. *Ibid.*, p. 284.

15. *Ibid.*, p. 13, note 5. There is related danger, sometimes found in the writings of historians who base their statements about the tactics of an army on its manuals—and that is that they often have not read those manuals. As a case in point, many historians have stated with great assurance that the French 1791 *Règlement* institutionalized the use in the Revolutionary and Imperial armies of the column as the offensive formation in preference to the line and also introduced the use of a thick "cloud of skirmishers" to unsettle the ranks of an opposing army. The reviewer has read both the original French edition and two English translations of the *Règlement* and can report with some assurance that the manual does not favour the column over the line—both are given equal weight as attack formations—and there is remarkably little mention of light infantry or skirmish tactics in the original manual. It would seem that, only too often, historians read more into period military manuals than is actually contained in these works.

16. p. 284. Here, at least, B-GL-300-002/FP-002 (paragraph 28.a.2 on page 1-17) advises that:

There are occasions where defensive operations will [sic] necessary and even desirable. The object will be to force the enemy to take action that narrows his options, reduces his combat power and exposes him to a decisive counter-offensive.

17. For a surer analysis of this subject, see Winfried Heinemann, "The Development of German Armoured Forces, 1919-1940," in J. Paul Harris and F.H. Toase, *Armoured Warfare* (London, 1990), pp. 51-69.

18. Von Lüttwitz chose to defend the critical point, not by occupying it, but by dominating it with firepower. It was the correct choice and the possible argument that "so what -- we won, didn't we?" overlooks the cost. The 4th Armoured Division lost 159 tanks, about 70% of its tank strength, to accomplish its mission at the Hochwald; the losses of 10 Canadian Infantry Brigade, the principal formation involved, totalled 858 killed, wounded, and missing—about a third of its total strength. For an analysis of the battle of the Hochwald, see the reviewer's book *South Albertas; A Canadian Regiment at War* (Toronto, 1998), pp. 266-296.

19. In terms of the uses and abuses of German military doctrine, see particularly the work of Robert Citino, "*Die Gedanken sind Frei*: The Intellectual Culture of the Interwar German Army," *Army Doctrine and*

*Training Bulletin*, 4, 3 (Fall 2001), pp. 48-55; Lieutenant-Colonel Ian Hope, "Misunderstanding Mars and Minerva: The Canadian Army's Failure to Define an Operational Doctrine," *Army Doctrine and Training Bulletin*, 4, 4 (Winter 2001-2002), pp. 16-29; Lieutenant-Colonel Roman J. Jarymowycz, "Doctrine and Canada's Army: Seduction by Foreign Dogma: Coming to Terms with Who We Are," *Army Doctrine and Training Bulletin*, 2, 3 (Aug 1999), pp. 48-52; Lieutenant-Colonel Chuck Oliviero, "Trust, Manoeuvre Warfare, Mission Command and Canada's Army," *Army Doctrine and Training Bulletin*, 1, 1 (Aug 1998), pp. 24-28; and

"Auftragstaktik and Disorder in Battle -- Learning to 'See the Battlefield' Differently," *Army Doctrine and Training Bulletin*, 4, 2, (Summer 2001), pp. 57-59. All five articles have excellent notes, which can serve as a trustworthy guide to the sources of the doctrinal debate in Western armies that has been ongoing since the late 1970's.

20. Robert Citino, "Die Gedanken sind Frei: The Intellectual Culture of the Interwar German Army," *Army Doctrine and Training Bulletin*, 4, 3 (Fall 2001), pp. 48-55, 54.

## Big hand, little map...

### The Canadian Military Atlas: The Nation's Battlefields from the French and Indian War to Kosovo

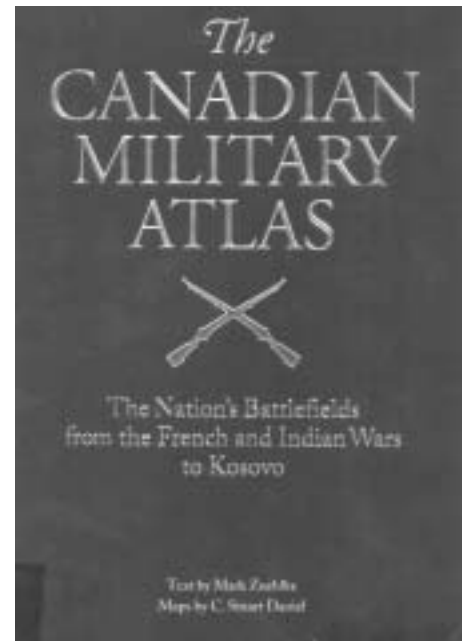
Reviewed by Major John R. Grodzinski, CD

**H**istorical atlases are wonderful things. Using concise narrative and clever cartography, they can lift the fog of war and aid our understanding of military events. Many superlative titles have been published over the years, such as Esposito and Elting's *Military History and Atlas of the Napoleonic Wars*, Esposito's *West Point Atlas of the Civil War*, Pimlott's *Atlas of Warfare*, Summers' *Historical Atlas of the Vietnam War* and three-volume *Historical Atlas of Canada*. The typical format is one or two pages of text, followed by a full-page map and so on. The maps are what really tell the story. Many of these would make it to the "if you were stranded on a desert island and could only have a handful of books" list.

With 1000 years of military heritage, an atlas of the wars that established Canada and our global military heritage would be a most welcome addition to the canon of military history. Until now, the best maps were found in the official histories produced by the Army Historical Section and the Directorate of History and Heritage. They still are. Modern examples of this tradition continue with such artists as Mike Bechthold, who draws the maps for "Canadian Military History," and Chris Johnson, whose exquisite maps have appeared in

several titles such as *The Royal Canadian Armoured Corps: An Illustrated History* or the War of 1812 studies published by Robin Brass Studio.

Unfortunately, *The Canadian Military Atlas* is a poor book. There are many problems. The chapter narratives lack Canadian context and in many instances describe Canadian participation too briefly. The task of crafting a narrative spanning the four hundred years of history covered in this atlas is clearly beyond the author. The bibliography speaks of the limited research. The maps are disappointing. The introduction, "Mapping Canada's Military History," offers a good overview of the operational and historical uses of maps and some of the pitfalls; a map "that visually captures the story of topography and movement unique to every battle is precious." A good map is a delicate balance between detail and simplicity: a map with "too much detail mires the broad story in minutiae;" one with "too little and [the] essence is lost." The required balance is not achieved in this book. Produced by the same cartographer who drew the maps in Zuelke's *Ortona* and *Liri Valley*, the maps do not provide "lucidity" as promised. For an oversized book, it is strange that only one map is larger than one half of a page.



***The Canadian Military Atlas: The Nation's Battlefields from the French and Indian War to Kosovo* by Mark Zuehlke and C. Stuart Daniel. Toronto: Stoddart, 2001. 228 pages, 80 maps, 50 photographs. \$100.00.**

Many topics that would have added to the literature are missed or inadequately presented in the maps. The First American War, or the Revolutionary War, has but three general maps—nothing about operations in Nova Scotia nor any detail about the attacks against Montréal and Québec. In the discussion of the initial American plan to capture Kingston in 1813, the author does not reveal why this plan was changed and Wilkinson's army sent down the St. Lawrence instead of against Kingston, which is an important point. The map of the "Battles of Chippewa and Lundy's Lane, July 1814" incorrectly shows the British deployment at Chippewa in column (obviously mimicking popular history) rather than in line. Switching to South Africa, there are two maps

of Paardeburg, but none of Leliefontein or the 40-odd other battles Canadians participated in. The First and Second World War maps generally dismiss the enemy. There are maps for Ortona and the Liri Valley, but none for the Gothic Line Campaign, probably the best Canadian corps level campaigns of the war. The post-1945 maps offer almost nothing about Canadian deployments. The book supposedly includes Kosovo, but there is no map of it.

Certain terminology and omissions are curious. Usages like World War I and World War II demonstrate the increased adoption of foreign designations into our historical lexicon. While this may be moot for some, the official Canadian designations set by terminology boards are: the First World War, the Second World War, and the Korean Conflict. The Cold War did not end, as is suggested, in 1965. Only five paragraphs discuss the employment of Canadian forces during the Cold War. There are no maps of the movement of the brigade group or air division to England, France, or West Germany, which was the largest peacetime movement of Canadian military

personnel ever. The Gulf War maps give a general overview of bases and the conduct of Operation "Desert Storm," but do not show deployment areas for Canadian ships, aircraft and units. A decade of intense Canadian participation in the Balkan wars and peace process is limited to three very poor maps. The maps of other peacekeeping operations seem to appear as an afterthought and give the impression that post-Second World War Canadian military history is irrelevant, which is at least consistent with our general difficulty in assessing post-1945 Canadian military history.

The publisher offers an unorthodox categorization of wars, campaigns, and battles that is inconsistent with the table of contents. The campaigns of the French and Indian War, that momentous series of four wars between the French, British and Iroquois Confederacy for domination in North America between 1689 and 1763 and the Seven Years' War are intermingled. The War of 1812 is included in the "War with the Thirteen Colonies," and the Gulf War is listed as a peacekeeping operation.

This book could have been a wonderful addition to any library, at any price, and could have proven useful for the course given at the Canadian Land Force Command and Staff College or even the Canadian Forces College. It could have aided our historical consciousness by bringing to life what we have done. By reducing Canadian military history and the efforts of thousands of Canadians in war and peace to nothing more than a few broad sweeps on some poorly drawn maps, it has not contributed anything to our understanding of Canadian military history. Writing history is about solid research and pinning down details. Both the author and cartographer have missed this. The quest for a comprehensive, quality Canadian military atlas has, unfortunately, not been met with this offering.

*Major Grodzinski is a staff officer at the Land Force Doctrine and Training System Headquarters in Kingston and Managing Editor of the Army Doctrine and Training Bulletin.*



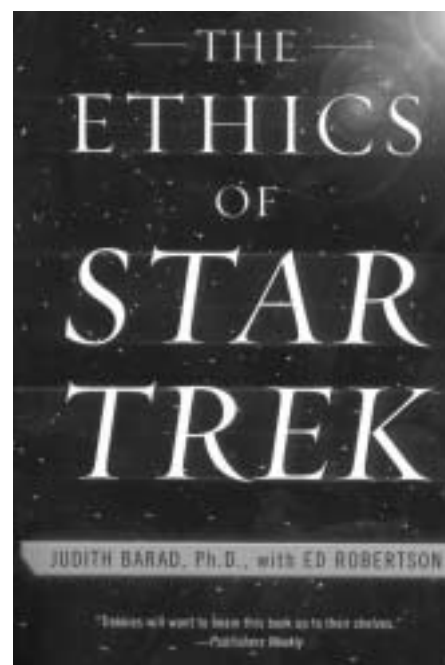
## The Ethics of Star Trek?

Reviewed by Captain James McKay, CD

Judith Barad and Ed Robertson's *The Ethics of Star Trek* was an unusual choice for a book review in *The Army Doctrine and Training Bulletin*. The book's presence in the office led to some curious reactions from passers-by, ranging from avid enthusiasm to complete puzzlement. At least the word "ethics" in the title seemed topical. After the events of the 1990s—when the conduct of particular individuals suggested there was an ethical crisis and, because of dramatic geopolitical changes, members of the Canadian Army found themselves facing more complex ethical situations in peace operations than they ever had during the Cold War—

ethics have become an important issue for the Canadian Army. Nevertheless, what can possibly be gleaned in terms of ethics from a television series? After all, one does not expect the mass media to behave ethically, regardless of their own propaganda.

Barad and Robertson's book is a work in which two seemingly dissimilar topics are fused to generate greater interest in one or the other. As the title suggests, *Star Trek* is fused with the study of ethics. Judy Barad, the Chair of Philosophy at Indiana State University, is the primary author. Professor Barad's other works have focussed on Saint Thomas Aquinas and his thought. Ed



*The Ethics of Star Trek* by Judith Barad, Ph.D., and Ed Robertson, New York: Perennial, 2001.

Robertson, an editorial consultant who has written a series of books on television and popular culture, assisted her in the development of the book. The book appears to be an emulation of Lawrence M. Krauss' *The Physics of Star Trek*, which sought to distinguish what was accepted scientific fact and theory from what was interesting and imaginative fiction.<sup>1</sup> Fusion, in this case, is apropos. Barad and Robertson note that art is often a reflection of "contemporary mores"<sup>2</sup> The four television series used as case studies—*Star Trek* (1966-1969), *Star Trek: The Next Generation* (1987-1994), *Star Trek: Deep Space Nine* (1993-1999), and *Star Trek: Voyager* (1995-2001)—mirrored the social values of their eras.

So who is the intended audience of *The Ethics of Star Trek*? Who would buy this book and in what section of the bookstore might one find it? The publisher labelled it as philosophy, but it is entirely plausible that for the sake of sales, a store might place copies in the science fiction section to attract the "Trekkie's" (or *Star Trek* fan's) eye. If one removes the commercial motivations associated with the publishing industry, one is left with two likely groups that might be interested in the book: "Trekkies" and those interested in philosophy and ethics.

The contemporary view of ethics is driven from corporate necessity: they are benignly neglected until the unethical behaviour of individuals creates an embarrassment to the organization and the need to address the issue. Are "Trekkies" fundamentally unethical? Does their behaviour need to be informed by ethics? Unless being a fan of a particular series or attending the occasional convention are deemed unethical behaviour, the answer is no. Yet these two questions illustrate the contemporary view of ethics as a means of addressing individual behaviour through making human institutions responsible in a moral sense. Are ethicists fascinated with *Star Trek*? Anecdotal evidence suggests that they are, but logically (to borrow a phrase from Mr. Spock) not every ethicist is a fan of science fiction.

So why do the various series of *Star Trek* hold a strong place in the minds of ethicists, and for that matter, the public

at large? The first series was actually not popular when it was initially aired. As it continued to be aired in syndication after 1969, it gained increasing popularity among a rather devoted band of fans.<sup>3</sup> The "Trekkies" developed a well-deserved reputation for being somewhat cultish in the 1970s, and this trend renewed itself with the airing of *Star Trek: The Next Generation* in 1987. All four series were collections of morality plays in which the characters grappled with a series of dilemmas created by the complexity of duty, interpersonal relations, and difficult situations.<sup>4</sup> The *Star Trek* universe, if you will, has spanned over four decades, which, it must be added, have been four decades of profound social change for the Western world. Values and attitudes as well as the popular perception of future technology have shifted over time, and this influence can be seen in the series. The book discusses each series, demonstrating the different ethical outlooks and compositions of each individual series.

It is not possible to properly review this book without first explaining the personal reactions to the notion of a book fusing the study of ethics and *Star Trek*. After some initial interest created largely by sheer curiosity and a healthy dose of cynicism, I found myself volunteering to review it. I experienced three reactions, and each of these can be loosely equated to mental images about the book.

#### 1ST IMAGE – POP CULTURE REACHING FOR ACADEMIC CREDIBILITY

One occasionally hears or reads reports of a university or college offering a course in popular culture. This is typically treated with derision by the media (by casting aspersions of wasting education on the study of the mundane) and by significant elements of the academic community (in order to maintain the degree of exclusion within their profession). Yet "pop culture" exists, and the *Star Trek* series are no exception. Elements of dialogue from the series are now parts of the popular lexicon. For example:

- "Make it so!"
- "I canno' do it!"

- "I'm a doctor, Jim, not a magician!"
- "Resistance is futile – you will be assimilated."

My first reaction to the book was to view it with great suspicion. This suspicion increased after flipping through the book and noting a relative absence of footnotes about where (the source text and passage) particular theories came from, but the nuances of *Star Trek* were explained very well. This is a weakness, in that it is not possible to go and compare Barad and Robertson's analysis and explanation of the major philosophical theories without having to read the entire book. At the back of the book is a comprehensive list of primary books worth reading on philosophy on the one hand and *Star Trek* on the other. Further reflection led to two conclusions. One, publishers hate footnotes in what they perceive as non-academic books because they interfere with saleability. Publishers believe, perhaps not necessarily incorrectly, that the common person doesn't actually read footnotes, much less care. This belief is dangerous, as footnotes display to all concerned that the authors showed due diligence in their research and allow those interested in the topic to expand their own readings. Given that this can be easily attributed to a publisher, it would be wholly unfair to pillory Barad and Robertson for this crime. The second conclusion is that they may have deliberately included fewer footnotes in favour of a list of primary works so that the reader, having had his/her interest piqued by, say, *Ethica Nicomachea*, would go read Aristotle. This, in itself, offers the dilemma of an evil act leading to a good outcome, something which Captains Kirk, Picard, Sisko, and Janeway all had to deal with at one time or another.<sup>5</sup> Barad and Robertson quickly dispelled my suspicion by pointing out that the *Star Trek* series were a useful vehicle for the study of ethics and a good introduction to every major ethical theory.<sup>6</sup> Using a series of episodes as examples to illustrate each theory of ethics, the authors skilfully illustrate each theory and assessed how each was accepted or refuted in the *Star Trek* universe.

Barad and Robertson start by examining "cultural relativism," the

notion that the customs of diverse cultures form the basis of their morality, and therefore no universal form of morality exists as morality becomes opinion. This notion is linked to the “Prime Directive,” the Federation’s central standing order. Cultural relativism is a useful tool to guard against ethnocentrism and the notion that if something is offensive, it is therefore immoral.<sup>7</sup> Yet this notion is logically invalid—the conclusion does not flow from the premise. After illustrating the nuances of cultural relativism using the episode “Cost of Living” from *Star Trek: The Next Generation*, the authors note that the central premise of cultural relativism is that customs are equal to morality.<sup>8</sup> Yet there is no link between customs and a lack of objective truth in morality. Given that I had perceived these shows as politically correct visions of the future, where sanctimonious technogeeks reigned largely by speaking in pseudo-scientific phrases to confuse those around them, I was intrigued when Barad and Robertson bashed in the door of cultural relativism. This book is worthwhile.

## 2ND IMAGE – PHILOSOPHY FOR THE MASSES

It came to appear that the book was not about elevating pop culture to the level of academia; it was about bringing complex philosophical notions to the masses! I remained somewhat suspicious—this held out the possibility that such ideas had to be made palatable if intended for a pedestrian audience. Fortunately, Barad and Robertson do an excellent job of conveying the complex ideas without dumbing them down. While the book’s ventures into the theories are not necessarily deep (and therefore lengthy) investigations of theories of ethics, they are a valuable series of teasers for the reader’s thoughts to encourage future reading, thought or discussion on the issues. Footnotes notwithstanding, Barad and Robertson identify and explain each theory and illustrate applications of each theory using the characters and storylines from the series. It forces one to re-examine each character a second time. Captain Kirk goes from being the melodramatic

female-izer, to coin a phrase, whose paramours always look better in soft light to a leader casting himself in an Aristotelean mold, trying to stay within the “golden mean” between reason and emotion.<sup>9</sup> Before proceeding further with commentary on the illustrations, there needs to be a few words on each of the identified theories and which characters serve as the prime examples.

Plato’s ideas are often depicted in the various series of *Star Trek*, and Barad and Robertson are very diligent in identifying the degree to which particular characters embody Platonic thought or virtues. Plato believed in a system of “forms” or ideal states that could be applied to souls as well as societies. Souls, Plato believed, were composed of reason, emotion, and spirit, and the ideal societal organization ought to take this into account. Such a division of labour would see the existence of Guardians (representing reason), Warriors (representing spirit), and Workers (representing emotions). Plato also believed that in the ideal society, in which political power would be held by the wisest individual, a “philosopher king” or “philosopher queen.”<sup>10</sup> This wisest individual would be best able to determine the collective good, and when it should override individual needs.<sup>11</sup> Plato also believed that there was such a thing as a collective good, and individuals should subordinate themselves to this good. Seven of Nine, with her strong desire for perfection and Borg point-of-view, is the clearest representation of Platonic thought.<sup>12</sup> Most of the *Star Trek* captains, to one degree or another, rely on wit and wisdom to strengthen their leadership, but Captain Janeway of *Star Trek: Voyager* is the quintessential philosopher queen, showing the will and wisdom to override, when necessary, the personal wants and needs of her subordinates.<sup>13</sup>

The original series shows the strongest element of Aristotelian thought, and explores other ethical theories as well. Captain Kirk, while perhaps less of a philosopher king than others, embodies the Aristotelian ideal of treading the mean between reason and emotion, in order not to be overly analytical or emotional. Other characters provide examples of being extremely

analytical or emotional. Mr. Spock is pure reason in motion and represents two ethical types: he is both a stoic and a utilitarian. The original stoics believed that self-control was crucial. This theory posited that:

- All physical and emotional states (e.g., fear, pain and sorrow), which are considered negative, come from errors in judgement borne of ignorance.
- Evil acts and deeds are also the result of ignorance.
- Physical pleasures are a temptation that distract one from being virtuous.
- Virtue is based on personal qualities (honour, courage, self-restraint, endurance, and dedication to one’s community).<sup>14</sup>

Spock also represents a utilitarian outlook, where acts ought to serve “the greatest good for the greatest number.”<sup>15</sup> The irony here is that utilitarian thought is a tempered version of hedonism or pleasure-seeking. Spock could be accused of being illogical by having two somewhat mutually exclusive value systems, but Barad and Robertson note that utilitarians are less concerned about their own pleasure than that of others. Dr. ‘Bones’ McCoy, on the other hand, represents pure emotion and serves as a counter-point to Spock’s reason, logic and primarily numerical outlook on events.<sup>16</sup>

A few words must be said about Barad and Robertson’s treatment of “duty ethics.” This term is applied to a broad range of ethical theories (existentialism, Immanuel Kant’s views on duties, “*prima facie* duties,” and Tom Regan’s principles) and, perhaps due to the nature of the various *Star Trek* series, informed by philosophies and thoughts from the animal rights movement.

So what is existentialism? Barad and Robertson note that there are three major streams to this body of philosophy, which maintains that human existence is based on a series of choices. Choice can be informed by religion (as contained in the works of Søren Kierkegaard), by one’s position (as offered by Friedrich Nietzsche), or by its essence (as suggested by Jean-Paul Sartre).



Existentialist thought is most represented by the introspective and religiously-oriented series *Star Trek: Deep Space Nine*. This series spends a great deal of time examining the religious orientation of the Bajoran race and the effects on duty at the space station *Deep Space Nine*. This examination offers a way of conveying some of Kierkegaard's thoughts, including the belief that ethics are "... a prologue to religion ..." where people would first act in accordance with their own views, then societal norms, and finally with God's will.<sup>17</sup> Kierkegaard's theories, Barad and Robertson point out, offer exceptions, while the vast majority of ethical theories are absolute.<sup>18</sup>

Nietzsche's version of existentialism is addressed in the theories, and Barad and Robertson rightly observe that it is rejected in the future offered by *Star Trek*. Nietzsche believed that strength and morality were intertwined and, as Barad and Robertson put it, "might makes right" where the powerful are strong, self-reliant, and show leadership.<sup>19</sup> They also associate what Nietzsche saw as weak morality and Christian ethics, where strength is seen as evil, as it leads to fear and the will and power to rule.<sup>20</sup> Antagonists in the series often display the Nietzschean morality of the strong and make their choices accordingly.

Sartre's offering to both the *Star Trek* universe and the realm of philosophy is the notion that "existence precedes essence," that is, individuals, lacking a set purpose, develop one that matches their character over time.<sup>21</sup> This development is based on a series of choices made by the individual, and this means everyone is responsible for his/her lot in life. This, naturally, leads to a perpetual anxiousness in every individual.<sup>22</sup> One can see these themes throughout the various series, where choices are made and characters are developed as a result. Seven of Nine and Data, both of whom are at least part cyborg but develop human characteristics as a matter of choice, are the best examples.

Yet the most useful topics in this book pertain to the ethics of duty. Such ethics are not the ethics of duty to one's

country or peers, but duties in a much wider sense. The thought of Immanuel Kant, an Eighteenth Century philosopher, is often reflected in *Star Trek*. One of Kant's beliefs was that "... because all rational beings have intrinsic worth, they should never be used as a means to achieve an end ..." <sup>23</sup> Both Captain Picard and Dr. Crusher of *Star Trek: The Next Generation* epitomize such beliefs and maintain they have a duty never to exploit others regardless of the situation. Kant also believed that duties were the basis of ethics and they ought to come from pure intentions as opposed to self-interest.<sup>24</sup> This is an important belief. Corporate ethics programs tend to be focussed on outcome, and an approach based on the premise that behaviour will change attitudes is often adopted as it is not easy to first change attitudes and then behaviour. This approach does not advance ethics; rather, it reduces them to a justification of self-interest in order to avoid embarrassing behaviour or situations.

The book also explores two other duty-based theories of ethics. This exploration is again often done through the lens of *Star Trek: The Next Generation*. W.D. Ross's taxonomy of Prima Facie Duties is often demonstrated by the actions and interactions of the various characters:

These duties seem to encompass the diplomatic efforts of the *Enterprise's* crew and the "Prime Directive." The

showing a duty of justice. Yet, once a week, Captain Kirk or one of the other captains could be trusted, as a philosopher-monarch, to decide when to interfere for the better in accordance with the duties of non-maleficence and beneficence.

Barad and Robertson also include the work of Tom Regan, a professor at the University of California, which has been linked to the animal rights movement. Regan's contribution is the development of a set of criteria for "subjects of life": "... (1) beliefs and desires; (2) perception, memory and a sense of the future, including their own future; (3) an emotional life, complete with feelings of pleasure and pain'; and (4) preferences and the ability to initiate action in pursuit of their desires and goals æ" <sup>26</sup> Such criteria would include all animals. While this may appear to be innocuous, when viewed in the light of animal rights, it rapidly enters a realm of politics in which the Canadian Army and Canadian Forces ought not to be involved due to the charged, divisive and emotional nature of the issue.<sup>27</sup>

### 3RD IMAGE – A PALATABLE PEDAGOGICAL TOOL

After reaching Aristotle's means between reason and emotion, I developed the third image of this book. It is a useful aid in the introduction of the intellectual heritage of ethics to Canadian soldiers and service members.

<b>Duties from Prior Acts:</b>	Reparation – acknowledge and compensate prior wrongs Fidelity – honouring of prior obligations and commitments
<b>Duties of Gratitude</b>	Acknowledge and returns on others' prior actions
<b>Duties of Justice</b>	Equal consideration for every person
<b>Duties of Beneficence</b>	The lot of others can always be improved
<b>Duties of Self-Improvement</b>	We can always improve our own condition of knowledge or virtue
<b>Duties of Non-Maleficence</b>	'Non-injury'

Table : Prima Facie Duties <sup>25</sup>

latter notion is familiar to even those who watch only the occasional episode: the Federation is not to interfere in the development of other societies,

Despite its use of science fiction to distill ethical theories into less lofty packages, it is relevant. It offers a positive depiction of the future, where an

enlightened and tolerant society places its armed forces in harms' way for the purpose of doing good. The characters in the four series are usually faced with situations that required ethical conduct in the face of danger, evil, etc., and in most cases, the ethics of the conduct of one's duties collides with one or more philosophical theories of ethics. As a study of the latter, Barad and Robertson are clear on certain issues of relevance: "... all four shows recognize the importance of intention over the consequences of an action when evaluating the morality of an action ..." <sup>29</sup> Ethics, the authors correctly observe, are about the individual's intent leading to the appropriate outcome and not just an outcome itself. Contemporary

society is scientifically oriented in outlook and naturally would like metrics to assess results. Ethics, unfortunately, do not lend themselves to being measured except by outcome. Intent cannot be measured but can be developed only by years of experience and introspection.

This book is very useful at introducing the uninitiated to the intellectually weighty realm of philosophy and ethics and should not be rejected as a piece of pop culture or "Trekkie-dom" and embraced as a means of introducing personnel to the central dilemma of ethics in a military institution: matching one's duty and conduct to a set of ethical principles.

This book allows all ranks to inform themselves better about issues that are unfortunately often reduced to slogans or the belief that what is legal is therefore right.

*Captain J.R. McKay is a member of the 1st Hussars' serving in the Directorate of Army Training. He is neither a professed specialist in ethics nor a Trekkie, but was recently called a would-be "comic philosopher-king" by at least one colleague. At last word, he was wrestling with the implications of his new title.*



## ENDNOTES

1. Lawrence M. Krause, *The Physics of Star Trek*, Toronto: HarperCollins, 1998.
2. Judith Barad, Ph.D., with Ed Robertson, *The Ethics of Star Trek*, New York: Perennial, 2001, p. xi.
3. In the late 1970s, a series of books with the novelized screenplay of each episode was printed in response to a potential demand: James Blish, *The Star Trek Reader*, New York: E.P. Dutton, 1976, *The Star Trek Reader II*, New York: E.P. Dutton, 1977, *The Star Trek Reader III*, New York: E.P. Dutton, 1977, and *The Star Trek Reader IV*, New York: E.P. Dutton, 1978.
4. Barad and Robertson, p. xi. After having read the book, I finally understood why all the philosophy majors at my alma mater would never miss *Star Trek: Deep Space Nine* and talk about it constantly.
5. While Immanuel Kant might take issue with this approach, a more contemporary view would accept this. Jane Jacobs' construct of the "Guardian" morality allows for deceit for the sake of the task in her *Systems of Survival*, Toronto: Random House, 1992.
6. Barad and Robertson, pp. xiii-xv.
7. Barad and Robertson, p. 4.
8. Barad and Robertson, pp. 1-9.
9. Barad and Robertson, p. 331.
10. Barad and Robertson, pp. 85-86.
11. Barad and Robertson, pp. 83-84.
12. Barad and Robertson, pp. 346-347. For the non-"Trekkie" readers, the Borg are a race of cybernetically enhanced beings whose consciousnesses are all linked, forming a single, real-time, meta-consciousness known as "the Borg Collective."
13. Barad and Robertson, p. 345.
14. Barad and Robertson, pp. 148-149.
15. Barad and Robertson, pp. 274-275.
16. Barad and Robertson, p. 331.
17. Barad and Robertson, pp. 169-170.
18. Barad and Robertson, p. 170.
19. Barad and Robertson, pp. 300-301.
20. Barad and Robertson, p. 303.
21. Barad and Robertson, p. 311.
22. Barad and Robertson, pp. 313 and 318-319.
23. Barad and Robertson, p. 335.
24. Barad and Robertson, p. 211.
25. Barad and Robertson, pp. 253-261.
26. Barad and Robertson, p. 238. Tom Regan, *The Case for Animal Rights*, Berkeley: University of California Press, 1983.
27. In the United Kingdom, militant animal rights groups are considered a threat to public security second only to the Provisional wing of the Irish Republican Army in import.
28. Barad and Robertson, p. 351.

# The Stand-Up Table

## Commentary, Opinion and Rebuttal

*On Starship Troopers – A Polemic, the Army Doctrine and Training Bulletin, Vol. 5, No. 1, Spring 2002.*

*Major Raymond Farrell, of the 2nd Regiment, Royal Canadian Horse Artillery, in Petawawa, Ontario, writes...*

I read with interest Mr. Ridler's defence of science fiction. While I completely agree that science fiction is as worthy a literary genre as any, I cannot agree that *Starship Troopers* belongs on *The Canadian Army Reading List*. My reasons have nothing to do with the book itself, however. I simply find the idea of a reading list appalling.

In his foreword to the list, the Chief of the Land Staff describes it as a "not exhaustive ... [but rather] a starting point to enhance professional knowledge." This strikes me as an odd premise. Either the books on the list are especially worthy or they are not. If they are not, then why are they there? To those who suggest that they are of some particular merit, I beg to differ.

Few would argue that, in any field, there is some definite canon of works that are obviously better than every other book ever written on the subject. For one thing, the relevance or quality of a work is utterly subjective. I, for example, find *Starship Troopers* to be campy literature and insipid military commentary. No matter—Mr. Ridler and many other intelligent people appreciate it. More fundamentally, there are simply too many good books in the world for anyone to begin to read them all even in a lifetime of study. Even if we all agreed on the merits of the books on list A, lists B to Z would still have just as many fine titles. Can we in all seriousness suggest that *Anabasis* and *The Grand Strategy of the Roman Empire* are in any way better than hundreds of other volumes written on ancient warfare? We cannot honestly

compare, for who among us has read even a fraction of them? Since our *Army Reading List* suggests books from almost every branch of the humanities as well as technology and military science, there are enough excellent candidates to fill entire libraries. No single human could ever begin to know them all. In other words, one starting point is as good as another.

*On "Leadership and the Future" by Sergeant Jim Hill, the Army Doctrine and Training Bulletin, Vol 5 No. 1, p. 88 - 90.*

*Captain Mike O'Leary, Adjutant of The Princess Louise Fusiliers writes...*

Having read Sergeant Hill's dissertation several times I find it difficult to decide where to begin to deconstruct the fallacies in his arguments. He has taken the single fact that there are overlaps in the technical skill training of junior officers and NCOs, tossed in a liberal share of misinterpreted military history and culture, and laced it heavily with a poor understanding of the relative importance and roles of NCOs and officers. I can only imagine that this article was published principally to engender discussion and promote rebuttal.

Sergeant Hill never actually states his conclusions in clear language. So, for the record, I shall attempt to outline what he appears to be saying:

- Junior officers are redundant, unnecessary and an unwelcome burden on the tacit command responsibilities of the senior NCO, and

Perhaps a simpler starting point would be a library or a bookstore. Others might be book reviews, bibliographies, or just the recommendations of friends. Nobody doubts the value of a better read and more educated officer corps. As professionals we need to mix professional development into our reading along with those books we read for interest alone. Individually and collectively, if we recognize our responsibility to maintain and deepen our professional knowledge, then we will certainly read a lot of books. The list is endless.



- It is viable to have a single career path starting at private, progressing to warrant officer, then transitioning to commissioned rank as a captain (at about what we consider the company second-in-command or second extra-regimentally employed staff officer level of experience and knowledge) followed by the usual officer progression to (potentially) "command the Legion."

While I would never presume to denigrate the NCO corps in the same fashion that Sergeant Hill has taken the liberty of regarding junior officers, and the concept of an officer corps in general, I do take offence to his extrapolation of military culture from his own limited observations from the centre of an armoury floor. His broad generalizations and attempts to present the tenets of his case as obvious fact without presentation of research references or qualifying the relevance of his more obscure references plays

upon readers to accept his presentation as simple fact, rather than as his personal opinion. If he would abide by his own argument, it is perhaps time that he relocate his observation post to the officers' mess, and allow an experienced senior NCO to co-ordinate his battle for him.

I must admit, there is no simple retort for the complexities of this diatribe. So many points merit rebuttal that the core arguments would be lost in the morass of historical and philosophical argument. I will attempt to focus on a very few points to outline weaknesses in Sergeant Hill's case, leaving it to the reader to review and re-analyze the remainder on their own merit (or lack thereof).

Why *do* junior officers exist? Why do 25-year-olds command platoons/troops, including very experienced and capable sergeants and warrant officers? I can think of a few good reasons. The NCO is raised on tradition, habit and the way we did it last year. This is not to say that our NCOs do not have flexibility of mind, intelligence or initiative, but their bread and butter is stability and continuity. The young officer is force-fed tactics and training methodology, with the simultaneous expectation to observe everything with a critical eye, to develop new approaches, comprehend the principles behind new technologies, and to integrate everything dynamically without the benefit or friction of long years of experience or habit. Again, we must be careful not to presume the promotion of stereotypes or generalizations; not all, perhaps one should say few, achieve all that is expected of them. Many do not.

Currently, the employment of 25-year-old troop/platoon commanders ensures that an officer gains training, experience and knowledge to be a 35-year-old sub-unit commander and, possibly, a commanding officer before reaching the age of 45. This ensures that field commanders will retain the vigour of mind and body necessary to lead soldiers in battle. Sergeant Hill's

plan would see 35-year-old warrant officers being commissioned and beginning to learn how to be sub-unit seconds-in-command and staff officers. This would result in 45-year-old sub-unit commanders and 55-year-old commanding officers. Luckily for us, the retirement age was recently increased.

I am not sure which pay scale Sergeant Hill has used to claim that a junior officer receives better pay. A quick search of the DIN shows that he is mistaken. A Regular force second lieutenant has a basic pay of \$3359 per month and that of a lieutenant is \$3408. Compare these to the corporal's \$3497 and the warrant officer's \$4476. The Reserve pay scale is similarly weighted, with second lieutenants and lieutenants earning daily rates of \$79.04 and \$103.78, respectively, compared to the corporal's \$97.72 and the warrant's \$125.08. Similarly, his other arguments for better conditions for the officer hold much less weight than he would presume.

I must take umbrage, however, with Sergeant Hill's observation that a junior officer is little more than a warrant officer's signaler. I am not sure which is more dismaying, the Sergeant's intentionally poor understanding of an officer's responsibilities, or the possibility that junior officers may have actually been so misemployed as to create and reinforce such a view. Even when an officer, by virtue of limited experience and training, relies heavily upon his NCOs for technical guidance, if any of them presume to imagine that the command relationship is reversed, then they need to re-examine their own motives for holding the rank that they do. Every professional soldier in our army will acknowledge that one of the responsibilities of the senior NCO is to guide and assist with the development of the junior officers. Good NCOs help develop very good sub-unit commanders and commanding officers. NCOs who poison this responsibility with misshapen ideals of their role produce bitter officers who never trust or appreciate their NCOs. I would

question the ethical values of the NCOs in any unit where the normal behaviour of soldiers is to "look to the platoon warrant for confirmation when the platoon commander gives an order," for they have obviously dedicated themselves to undermining the officers' authority. Do they also look to the RSM when the commanding officer issues orders?

Sergeant Hill attempts to demonstrate the lack of necessity for junior officers by his example of the battery command post conducting fire missions with no commissioned officers at the battery. All the NCOs concerned were qualified to execute the technical duties for the firing tasks and, for a single battery, they were fully capable of executing such technical gunnery. That same command post was likely not simultaneously passing fire tasks and observer's data on a "regimental ring net," passing fire plan serials to an affiliated mortar platoon, planning the battery's next move and conducting fire plans with multiple fire units in conjunction with the remainder of a regiment's batteries. Alternatively, if a battery command post were staffed by capable unit officers, would it make a case to dispose of the NCO corps?

The two-tiered command structure is neither wasteful nor anachronistic, as Sergeant Hill would have us believe. It is a valued and important part of our army structure, proven in battle and garrison, and providing essential roles for both groups. Despite Sergeant Hill's intimation that we should return to the command structure that served the Legions, with their technological and tactical simplicity, Company seconds-in-command and company sergeants major are not interchangeable, and neither are quartermasters and headquarters' staff officers.





---

**An officer and soldiers of the Carignan-Salières Regiment on the march between 1665 and 1668**

The Carignan-Salières Regiment was the first regular unit to serve in Canada being formed in 1665 by the amalgamation of two older French units. Following their arrival in Canada, members of the regiment constructed forts along the Richelieu River and launched two expeditions against the Mohawks in 1666, which ultimately led to a truce between the Iroquois and French in 1667. Part of the regiment returned to France in 1667, while the remainder garrisoned the forts on the Richelieu. In 1668, about 400 officers and men took their discharge in New France. (Courtesy Parks Canada)

---



---

**Members of The Provincial Corps of Light Infantry (Canadian Voltigeurs) on the march in 1813**

The Canadian Voltigeurs were formed on 15 April 1812, just prior to the outbreak of the War of 1812. Formed under the Militia Act of Lower Canada, the Voltigeurs were a regular unit of full-time soldiers raised and paid by the Province of Lower Canada, but not part of the Regular British Army establishment. Between 1812 and 1814, companies of the Voltigeurs served in both Lower and Upper Canada and participated in several battles, most notably the British attack on Sacket's Harbor, the Châteauguay and Crysler's Farm, all in 1813 and also took part in the ill-fated Plattsburg campaign of 1814. The unit was disbanded on 24 March 1815. (Courtesy Parks Canada)

---